

# Nine Minimum Controls – No. 6

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## 6.0 CONTROL OF SOLID AND FLOATABLE MATERIALS IN CSOs

### 6.1 OVERVIEW

CSOs can contain solid and floatable material that are easily seen and can be the source of pollutants in receiving waters. The sixth of the nine minimum controls contemplates the reduction, if not elimination, of visible floatables and solids using relatively simple measures. Based on the City's experience with its CSS, including that gained through daily visual inspections and via the assessment described below, solids and floatables are not frequently observed at CSO discharge sites. This is perhaps due to the significant pollution prevention measures (e.g. street cleaning, leaf collection, catch basin cleaning, etc.) long undertaken by the City (such measures are described more fully in Chapter 7) and the City's use of catch basins. Nonetheless, the City has identified three sites at which it intends to conduct pilot studies to further ensure adequate solid and floatable controls.

Catch basins are structures used to collect storm water entering the City's CSS. Catch basins are modified inlets where the invert of the outlet pipe is several feet above the bottom of the structure and where a 90 degree trap is installed on the end of the outlet pipe. See Figure 6-1. This configuration causes some storm water to be retained in the structure. This reduces velocity and allows larger solids to collect in the bottom of the structure. This also traps floatable material in the structure and prevents sewer gasses from exiting the structure. Therefore, most of the floatable and solid materials in the storm water can be removed from the combined sewer system by preventing entry into the system through the proper monitoring, operation, and maintenance of the catch basins. There are no similar structures to remove solids and floatable material from the sanitary sewage flows.

In this Chapter the appropriate operating, inspection, and maintenance procedures presented in Chapter 1 will be referenced, the investigation of existing floatable and solid material discharges discussed, and goals for future changes and improvements will be presented. The exhibits of this chapter contain a copy of the investigation of existing floatable and solid material discharges, recommendations for future improvements, and records of annual activities.

### 6.2 OPERATING, INSPECTING, AND MAINTAINING

The primary method for controlling the discharge of visible solid and floatable material is the use of catch basins in the CSS. There are more than 4,957 of these structures located throughout the City's CSS area. Each catch basin has a unique identification number with information about its location stored in the City's GIS. The locations of catch basins can be retrieved in a number of ways with GIS tools.

# Figure 6-1



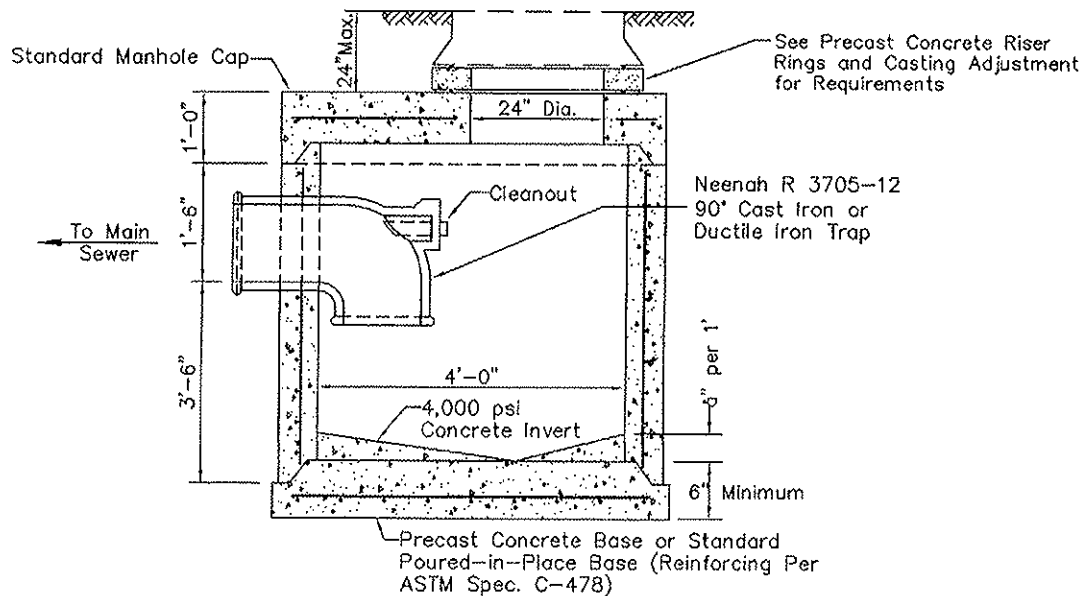
City Utilities  
Department  
of Water  
Resources

## STANDARD CATCH BASIN

Created: January 1, 2002

Revised:

Castings:  
24" Beehive Casting;  
24" Manhole Frame and Grate



Note:  
General Construction Requirements Same as Standard 48" Manhole  
Structure Base Alternatives Same as Standard 48" Manhole

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## 6.2.1 Operation

Catch basins do not have any moving parts or adjustable features. Therefore, no effort is required to operate them. The most important thing is to make sure they are installed where appropriate.

## 6.2.2 Inspections

Catch basins are routinely inspected for damage approximately once every 2.5 years. Additionally, catch basins are further inspected whenever street or yard flooding is reported to or observed by the City. When that occurs, inspectors are dispatched to make sure catch basins are neither damaged nor plugged.

## 6.2.3 Maintenance

Chapter 1 contains detailed procedures and schedules for catch basin maintenance. Table 2 in Exhibit F-2 contains information on reported tons of material collected from 1998 to 2003. Additional information on catch basin cleaning can be found in Chapter 7. Catch basin cleaning has been tracked in the City's GIS database since 2005. Catch basins identified as problematic based on experience are identified in GIS and cleaned with greater frequency.

## **6.3 INVESTIGATION OF EXISTING SOLID AND FLOATABLE MATERIAL DISCHARGES**

### 6.3.1 Purpose

The purpose of investigating existing solid and floatable material discharges from CSOs is to identify the extent of the problem and the type of material that needs to be controlled.

### 6.3.2 Process

The steps of the discharge investigation are:

- Conduct and document visual surveys of each CSO discharge point
- Develop criteria for selecting sampling sites
- Sample and characterize solids/floatables discharged
- Summarize solids/floatables control methods currently used
- Identify other suitable solids/floatables control methods not previously identified
- Recommend pilot improvements

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This process was utilized to investigate solid and floatable material discharges in the summer of 2004. The report on this investigation consists of 3 documents. “City of Fort Wayne Recommended CSO Sites for Further Solids and Floatables Investigation” dated July 23, 2004 documents the visual survey and information gathered from City staff on 44 CSO discharge points after a 0.2” rain event and is located in Exhibit F-1. The findings summarized in the report are consistent with daily outfall inspections performed by WPCM staff. Consistent with the City’s experience, the study concluded that floatables are not frequently observed at CSO discharge sites. Nonetheless, through the aforementioned study the City has identified three areas that are recommended for further solids and floatables control investigation. In addition to floatables information, the report also contained details on the observed CSO discharge point site conditions. Exhibit F-4 contains an update on recommended follow ups to some of the site conditions observed.

“CSO Solids and Floatables Control Plan for Selected Sites” dated November, 2004 discusses control methods and recommends pilot improvements and is located in Exhibit F-2. The report generally recommends that the City should continue its effective non-structural source control best management practices. It also recommends that a pilot structural facility be constructed for evaluation of floatables control technologies and documentation of their effectiveness in the City.

The “Report Clarification” dated November 22, 2004 shows how this investigation follows the guidance on the sixth of the nine minimum controls and is found in Exhibit F-3.

### 6.3.3 Pilot Projects – Further Investigation

It is the City’s intent to pilot structural floatable controls at three different outfalls and utilize at least two different technologies. The design goal will be the removal (at a minimum) of solids and floatables ½ inch diameter and larger. These pilot locations will be monitored for approximately 2 years and the results of these pilot facilities will be utilized in confirming the design goal for future LTCP floatables control construction, as specified in the LTCP.

## 6.4 INTERGRATION WITH LONG TERM CSO CONTROL PLAN

The controls proposed by City’s CSO LTCP generally consist of constructing a new parallel interceptor that will convey overflows from a majority of the regulators to the WPCP and CSO Storage Ponds. The remaining regulators and associated overflow points would be improved with either satellite storage or satellite disinfection facilities. All untreated overflows to receiving waters would

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be reduced to a specified level of control of a few activations in a typical year. The reduction of overflow events to receiving waters will greatly reduce the introduction of floatables and solids into the receiving waters.

In addition to the reduction in number of overflow events, the City's proposed CSO LTCP includes provisions for construction of structural floatables control (e.g. screens, baffles, separators or trash racks) at CSO outfalls that currently do not have structural floatables control.

The City has been advised by IDEM that such controls, if installed with respect to existing CSO outfalls, will not be subject to the setback requirements presented at 327 IAC 3-2-6. To the extent such setback requirements are applicable to other types of controls or facilities, the City recognizes that a variance application could be filed with IDEM under IC 13-14-8-8. Whether IDEM would deem the circumstances surrounding the siting of the facilities then in question to constitute an "undue burden or hardship" under IC 13-14-8-8 is unclear at this time. Moreover, even if IDEM were to find an "undue burden or hardship " to exist, IDEM is not required to grant a variance - IC 13-14-8-8 plainly provides that IDEM has the discretion to grant or deny a variance request even if it finds an undue burden or hardship to exist. Perhaps most significant is the fact that Indiana law expressly limits the duration of variances to a maximum of one year. To obtain permanent regulatory relief via a variance for a structure constructed within a 500-foot setback, an applicant would need to apply annually (and perpetually) for 1 year renewals of that variance. Under IC 13-14-8-8, IDEM would be able to annually revisit both its undue burden or hardship determination and its decision to grant or deny the requested renewal. In short, Indiana law contemplates a variance as a temporary means of regulatory relief of little value to applicants seeking to construct permanent structures. The City intends to construct its pilot facilities between 2008 and 2009. IDEM confirmation that setback requirements to floatables control will not apply will need to be obtained before any floatables control can be constructed.

### 6.5 RECORD KEEPING

Following the end of each calendar year, information on the catch basin maintenance and repair along with reports on the progress on recommendations and piloting work shall be gathered and added as Exhibit F-4 of this Chapter.

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## DIRECTORY FOR APPENDIX F (Items Presented in Order of Appearance in Appendix F)

<u>Item</u>	<u>Description</u>
Exhibit F-1	CITY OF FORT WAYNE RECOMMENDED CSO SITES FOR FURTHER SOLIDS AND FLOATABLES INVESTIGATION
Exhibit F-2	CSO SOLIDS AND FLOATABLES CONTROL PLAN FOR SELECTED SITES
Exhibit F-3	REPORT CLARIFICATION
Exhibit F-4	RECORDKEEPING

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### **EXHIBIT F-1**

## City of Fort Wayne Recommended CSO Sites for Further Solids and Floatables Investigation

TO: Pat Callahan/City of Fort Wayne

COPIES: Kurt Hellerman/CH2M HILL Milwaukee  
Rita Fordiani/CH2M HILL Boston  
Todd Webster/CH2M HILL Fort Wayne

FROM: Phil Blonn/CH2M HILL Milwaukee

DATE: July 23, 2004

### Introduction

To assist the City of Fort Wayne in its ongoing long term control plan for minimizing CSOs, 44 CSO sites within the City were observed by CH2M HILL staff during the week of May 10<sup>th</sup>, 2004. The purpose of this effort was to identify CSO locations with potential solids and floatables (SF) issues and determine which sites are the best candidates for further investigation into these issues through additional site monitoring/research.

### CSO Monitoring Site Evaluations and Recommendations

Data were gathered from 1) City CSO subbasin files; 2) discussions with City staff; and 3) in the field during site visits. Data collected are summarized on the attached CSO Data Forms. Photos taken at each site are also attached. Attachments are ordered by ascending CSO Overflow Point number as presented in the NPDES Permit. CSO activity information was collected from the subbasin reports and assembled into attached Table A. Table 1 presents a summary of the evaluation of each site.

TABLE 1

Summary of Evaluation of CSO Site Solids and Floatables Evaluation and Selection (in **BOLD**) for Further Investigation

Count	Overflow Point	Location Number	Receiving Water	Comment
1	004	J02-090	Saint Mary's River	Clean site and low CSO volume; outfall is submerged and river water flows back into system at a high rate; therefore, SF control is not recommended. Suggest reviewing/ correcting operation of tide flex.
2	005 (Adjacent to 006)	J11-164	Saint Mary's River	Heavy duty paper towels, rags, and sewer-related solids and floatables are regularly observed at this location according to city staff and high CSO activity; therefore, further investigation into SF control is suggested after closure of 006.

Count	Overflow Point	Location Number	Receiving Water	Comment
3	006 (Adjacent to 005)	J11-222	Saint Mary's River	Plans are currently in place to eliminate the 6" diameter outfall; therefore, SF control is not recommended.
4	007 (Adjacent to 056)	K03-092	Saint Mary's River	Sewer-related solids and floatables have been noted here in the past; non-sewer-related material observed during site visit, and there is low CSO activity; therefore, SF control is not recommended. Discharge pipe was completely submerged; suggest reviewing tide gate operation.
5	011 (Adjacent to 012)	K06-233	Saint Mary's River	Clean site at discharge location; however, regulator manhole had surcharged, lifting manhole lid and dumping sewage solids and floatables in area prior to pump station; area around manhole eroded, has occurred in past; high CSO activity. Suggest first researching and correcting the cause and then revisiting this site to determine if SF control is needed.
6	012 (Adjacent to 011)	K06-234	Saint Mary's River	Clean site at discharge location; however, regulator manhole had surcharged, lifting manhole lid and dumping sewage solids and floatables in area prior to pump station; area around manhole eroded, has occurred in past; high CSO activity. Suggest first researching and correcting the cause and then revisiting this site to determine if SF control is needed.
7	013	K06-298	Saint Mary's River	Non-sewer-related material observed during site visit (i.e., beer bottles, litter); high CSO activity staff believes to be due to plugged-up sewer lines; suggest review of sewer maintenance practices, but SF control is not recommended.
8	014	K07-106	Saint Mary's River	Non-sewer-related material observed during site visit (i.e., litter); low CSO activity; therefore, SF control is not recommended.
9	016	K07-109	Saint Mary's River	Headwall completely collapsed, several sections of pipe broken; non-sewer-related material observed during site visit (i.e., litter, household garbage); low CSO activity - never has been observed overflowing; therefore, SF control is not recommended. Suggest looking into closing off CSO.
10	017	K07-176	Saint Mary's River	<b>Sewer-related and non-sewer related (i.e., litter and garbage) solids and floatables have been noted here in the past and during site visit and there is moderate CSO activity; therefore, further investigation into potential SF control is recommended.</b>
11	018 (Adjacent to 019)	K11-165	Saint Mary's River	Sewer-related and non-sewer related (i.e., litter and garbage) solids and floatables have been noted here in the past and during site visit; significant CSO activity; other CSO control plans are in place; therefore, SF control is not recommended.

Count	Overflow Point	Location Number	Receiving Water	Comment
12	019 Adjacent to 018)	K11-178	Saint Mary's River	Sewer-related and non-sewer related (i.e., litter and garbage) solids and floatables have been noted here in the past and during site visit; significant CSO activity; other CSO control plans are in place; therefore, SF control is not recommended.
13	020	K15-116	Saint Mary's River	Clean site and high CSO activity; outfall is submerged and river water flows back into system; therefore, SF control is not recommended. Suggest reviewing/correcting operation of flap gate.
14	021	K19-044	Saint Mary's River	<b>Plume of sewage and solids and floatables observed during visit; high CSO activity; therefore, further investigation into SF control is recommended.</b>
15	023	L06-103	Saint Mary's River	Clean site and low CSO activity; outfall is submerged and river water occasionally flows back into system; therefore, SF control is not recommended. Suggest reviewing/correcting operation of flap gate.
16	024 (Adjacent to 025)	L06-420	Saint Mary's River	Clean site and moderate CSO activity; outfall is sometimes submerged and river water occasionally flows back into system; therefore, SF control is not recommended. Suggest reviewing/correcting operation of flap gate.
17	025 (Adjacent to 024)	L06-421	Saint Mary's River	Clean site and low CSO activity; outfall is sometimes submerged and river water occasionally flows back into system; therefore, SF control is not recommended. Suggest reviewing/correcting operation of flap gate.
18	026 (Adjacent to 027 and 033)	M10-151	Saint Mary's River	<b>Sewer-related and non-sewer related (i.e., litter) solids and floatables have been noted here in the past and during the site visit and there is high CSO activity; therefore, further investigation into potential SF control is recommended.</b>
19	027 (Adjacent to 026 and 033)	M10-202	Saint Mary's River	<b>Sewer-related and non-sewer related (i.e., litter) solids and floatables have been noted here in the past and during the site visit and there is high CSO activity; therefore, further investigation into potential SF control is recommended.</b>
20	028	M10-238	Saint Mary's River	Sewer-related solids and floatables have been noted here in the past (believed to occur only when pumps at adjacent pump house have been active) and during the site visit but there is low CSO activity; therefore, SF control is not recommended. Suggest reviewing pump operation/type.
21	029	M10-265	Saint Mary's River	Some sewer-related but mostly non-sewer related (i.e., litter) solids and floatables have been noted here in the past and during the site visit and there is low CSO activity; therefore, SF control is not recommended.

Count	Overflow Point	Location Number	Receiving Water	Comment
22	032	M10-306	Saint Mary's River	Non-sewer related (i.e., litter) solids and floatables have been noted here in the past and during the site visit and there is low CSO activity; therefore, SF control is not recommended. Outfall submerged, exact location and condition unknown. Suggest reviewing whether river water intrusion is an issue and condition of any back flow prevention.
23	033 (Adjacent to 026 and 027)	M10-313	Saint Mary's River	<b>Sewer-related and non-sewer related (i.e., litter) solids and floatables have been noted here in the past and during the site visit and there is high CSO activity; therefore, further investigation into potential SF control is recommended.</b>
24	036	M18-032	Spy Run Creek	Clean site and low-moderate CSO activity; therefore, SF control is not recommended.
25	039	N06-022	Maumee River	Clean site and low-moderate CSO activity; therefore, SF control is not recommended.
26	044	N22-093	Saint Joseph River	Minor sewer-related solids and floatables were noted during the site visit and there is low CSO activity; therefore, SF control is not recommended at this time.
27	045	N22-103	Saint Joseph River	Non-sewer related (i.e., litter) solids and floatables were noted during the site visit and there is low CSO activity; therefore, SF control is not recommended.
28	048	O10-252	Maumee River	Clean site/discharge even with high CSO activity; therefore, SF control is not recommended.
29	049	O10-257	Maumee River	Did not visit; considered eliminated by staff; suggest permanently removing from permit list.
30	050	O10-277	Maumee River	Clean site and low-moderate CSO volume; outfall is submerged and river water was observed flowing back into system; therefore, SF control is not recommended. Suggest reviewing/ correcting operation of flap gate.
31	051	O22-002	Saint Joseph River	Minor sewer-related solids and floatables and more non-sewer-related litter were noted during the site visit and there is low-moderate CSO activity; therefore, SF control is not recommended at this time.
32	052	O22-004	Saint Joseph River	<b>Solids and floatables (i.e., paper towels) were stuck in the flap gate during the site visit and there is low-moderate CSO activity; therefore, further investigation into SF control is recommended.</b>
33	053	O22-094	Saint Joseph River	Non-sewer related (i.e., litter) solids and floatables were noted during the site visit; low CSO activity; therefore, SF control is not recommended.
34	054	O23-080	Natural Drain #4, then St. Mary's River	Non-sewer related (i.e., litter) solids and floatables were noted during the site visit; low-moderate CSO activity; therefore, SF control is not recommended.

Count	Overflow Point	Location Number	Receiving Water	Comment
35	055	P06-192	Maumee River	Clean site; however, sewer-related solids and floatables have been observed in the past; high CSO activity. This site would be considered for further SF control investigation, however, city staff indicated that this would be a difficult site and should not be considered further at this time.
36	056	J03-313	Saint Mary's River	Sewer-related solids and floatables have been noted here in the past; non-sewer-related material observed during site visit, and there is low CSO activity; therefore, SF control is not recommended.
37	057	P10-121	Maumee River	Plans are already in place for CSO control; therefore, SF control is not recommended.
38	058	Q06-034	Maumee River	Non-sewer-related (i.e., litter) solids and floatables; low CSO activity; therefore, SF control is not recommended.
39	060	R06-031	Unnamed Ditch to Maumee River	Non-sewer-related (i.e., litter, garbage) solids and floatables; low CSO activity; therefore, SF control is not recommended. Water often discolored; suggest further investigation into surrounding site and potential implementation of best management practices.
40	061 (Adjacent to 062)	R14-137	Baldwin Ditch to stormwater ponds to Maumee River	Clean site; low-moderate CSO activity; therefore, SF control is not recommended.
41	062 (Adjacent to 061)	R14-138	Baldwin Ditch to stormwater ponds to Maumee River	Clean site; low-moderate CSO activity; therefore, SF control is not recommended.
42	064	S02-035	Unnamed Ditch to Maumee River	Non-sewer related (i.e., litter) solids and floatables were noted during the site visit; moderate CSO activity; therefore, SF control is not recommended.
43	067	K19-077	Saint Mary's River	Clean site; low-moderate CSO activity; therefore, SF control is not recommended.
44	068	N18-254	Saint Joseph River	Some sewer-related solids and floatables and some non-sewer-related litter were noted during the site visit; CSO activity is unknown at this time; therefore, SF control is not recommended at this time.
45		P10-001	Maumee River	Clean site; CSO activity unknown at this time; therefore, SF control is not recommended at this time.

In addition to recommending sites for further solids and floatables control investigation, Table 1 also identifies other sewer-related and public nuisance issues along the waterfront areas for informational purposes. For ease of review, Table 2 presents the locations where additional solids and floatables control is recommended for further investigation through additional research/monitoring.

**TABLE 2**

CSO Sites Recommended for Further Solids and Floatables Control Investigation

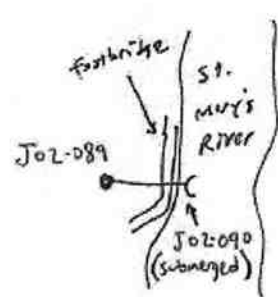
Overflow Point	Location Number	Street Location	Receiving Water	Discharge Size:
017	K07-176	Waldron Circle	St. Mary's River	42"
021	K19-044	Old Mill & Fairfax	St. Mary's River	66"
026/027/033	M10-151/M10-202/M10-313	3 <sup>rd</sup> Street and Calhoun	St. Mary's River	2 - 72" / 1- 72" / 4 - 42"
052	O22-004	St. Joseph River Drive behind Concordia Lutheran High School	St. Joseph River	48"

**TABLE A****CSO Characterization Based on Subbasin Reports and Staff Comment**

Overflow Point	Annual Model Results				Jan. - Apr. Data Frequency (no. of occurrences)	CSO Discharge Diameter	CSO Duration (hours/event)	Comments
	CSO Volume (cubic feet)	CSO Volume (million gallons)	CSO Frequency (times/year)	CSO Duration (hours)				
004	677,841	5.1	53	151	4	30"	3	
005	3,562,952	26.7	69	248	7	66"	4	
006	248	0.0	N/A	248	7	6"	N/A	
007	63,215	0.5	10	10	N/A	60"	1	
011	3,721,544	27.8	41	111	N/A	72"	3	
013	5,830,632	43.6	52	211	N/A	72"	4	
014	73,187	0.5	63	104	0	12"	2	
016	6,621	0.0	9	4	0	N/A	0	
017	963,279	7.2	32	88	8	N/A	3	
018	51,159,119	382.7	84	470	8	126"	6	
019	data included with 018					42"	N/A	
020	2,457,734	18.4	72	249	8	6'x6' box	3	
021	1,425,564	10.7	56	344	10	66"	6	
023	267,138	2.0	54	20	6	48"	0	
024	1,195,116	8.9	16	40	6	N/A	3	
025	48	0.0	1	1	5	60"	1	
026	data included with 033					72"	N/A	
028	471,877	3.5	15	24	4	30"	2	
029	604,752	4.5	70 / 26	34 / 2	13	48"	N/A	
032	183,098	1.4	5	44	7	N/A	9	
033	17,562,363	131.4	66	328	N/A	var. ~72"	5	
036	1,864,615	13.9	83	727	4	24"	9	
039	3,051,243	22.8	40	269	N/A	60"	7	
044	9,510	0.1	3	13	4	12"	4	
045	8,680	0.1	3	2	4	10"	1	
048	11,305,463	84.6	63	256	N/A	4 - 30", 5"	4	
050	1,621,933	12.1	52	294	2	36"	6	
051	291,092	2.2	10	26	5	18"	3	
052	782,402	5.9	45 / 17	231 / 27	7	48"	N/A	
053	134,659	1.0	9	19	5	42"	2	
054	511,038	3.8	27	100	5	48"	4	
055	2,959,476	22.1	62	515	7	48"	8	
056	63,215	0.5	10	10	N/A	2 - 36"	1	some data are for both 056 and 007
057	8,673,828	64.9	45	128	4	96"	3	
058	47,734	0.4	3	4	2	24"	1	
060	255,572	1.9	47	218	5	42"	5	
061	295,426	2.2	6	20	8	42"	3	
062	834,303	6.2	7	21	6	60"	3	
064	697,941	5.2	94	588	7	120"	6	
067	215,375	1.6	96	527	0	24"	5	
068	N/A	N/A	N/A	N/A	2	36"	N/A	

## **CSO Site Data Sheets and Photos**

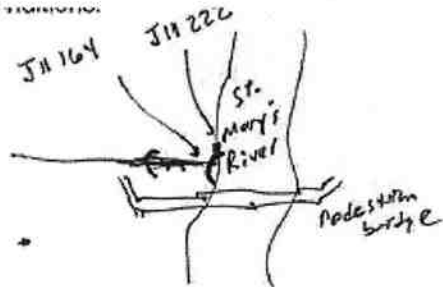
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 004	Location#: J02-090
Street Location: Rolling Mill Regulator; 1998 Taylor St.	Receiving Water: St. Mary's River
Subbasin: J02-089	Immediate Area Land Use (describe):  Industrial
CSO Annual Volume (cf): 677,841 (model)	CSO Annual Frequency (times/year): 53 (model); 4 (Jan.-Apr. data)
CSO Annual Overflow (hours): 151 (model)	Tide Gate Type: tide flex, records indicate it is chained open
Discharge Size: 30" diameter	Discharge Invert: N/A; submerged
River Elevation: 738+/- (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
<p>Summarize site history:</p> <p>No identifiabls have been observed at this location, no flow has ever been observed toward river at this location, river water flows into system at this point at a high rate</p>	
<p>Draw site/describe conditions:</p> <p>Outfall is submerged even when water level is low</p> <div style="text-align: right; margin-top: 20px;">  </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>None</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>None</p>	
Date of Visit: 5/12 11:59 a.m.	Name: Phil Blonn

J02-090



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: <del>006</del> 005	Location #: J11-164, <del>J11-222</del>
Street Location: Indian Village East of 4400 Bluffton Road	Receiving Water: St. Mary's River
Subbasin: K11-004	Immediate Area Land Use (describe):  Park
CSO Annual Volume (cf): 3,562,952 (model)	CSO Annual Frequency (times/year): 69 (model); 7 (Jan.-Apr. data)
CSO Annual Overflow (hours): 248 (model)	Tide Gate Type: J11-164: flapgate; <del>J11-222: duckbill</del>
Discharge Size: J11-164: 66" diameter; <del>J11-222: 6"</del>	Discharge Invert: $\approx 745+/-$
River Elevation: 740+/- (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  Heavy duty paper towels; heavy rags noted in the past; City trying to track source; identifiable observed in past; leaves	
Draw site/describe conditions:  Individual observed sitting on outfall manhole; appeared to be intoxicated  <div style="text-align: center;">  <p>The sketch is a hand-drawn map showing the location of the overflow point. It features two lines representing roads or canals, labeled 'J11-164' and 'J11-222', which intersect. A line representing the 'St. Mary's River' flows from the intersection. A 'pedestrian bridge' is drawn crossing the river. A small circle with a cross inside is marked near the intersection, likely representing the outfall manhole.</p> </div>	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  None	
Date of Visit: 5/12 9:45 a.m.	Name: Phil Blonn

J11-164, J11-22



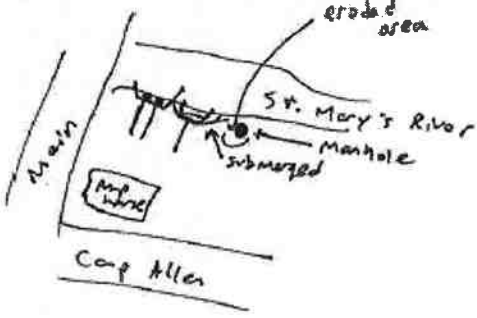
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 007	Location #: K03-092
Street Location: Brown Street Pump Station Regulator; 1800 Brown Street South Side of Brown Street just east of Electric Avenue	Receiving Water: St. Mary's River
Subbasin: J03-012	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 63,215 (model)	CSO Annual Frequency (times/year): 10 (model) no Jan.-Apr. data
CSO Annual Overflow (hours): 10 (model)	Tide Gate Type: flapgate
Discharge Size: K03-092: 60" diameter	Discharge Invert: 740.31
River Elevation: 735.0 (normal)	Last Precipitation: 5:00 p.m. yesterday
<p>Summarize site history:</p> <p>Identifiable residential sanitary sewage observed at this site in the past, not on this visit</p>	
<p>Draw site/describe conditions:</p> <p>Adjacent to Overflow Point 056, Location # J03-313</p> <div style="text-align: center;"> <p>The sketch shows a vertical line representing the St. Mary's River. To the right of the river is a rectangular box labeled 'Pump Station'. An arrow points from the river to the pump station. Below the pump station, an arrow points to a small circle on the riverbank, labeled 'K03-092 (submerged)'. The label 'J03-313' is written above the pump station.</p> </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>None</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>Small amount of litter</p>	
Date of Visit: 5/12 11:45 a.m.	Phil Blonn

K03-092, J03-313



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 011 * 012	Location #: K06-233 (two from pump station, K06-234 (large submerged one)
Street Location: just east of Nebraska pump station on west bank of St. Mary's River; Camp Allen and Main	Receiving Water: St. Mary's River
Subbasin: K06-290B	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 3,721,544 (model)	CSO Annual Frequency (times/year): 41 (model)
CSO Annual Overflow (hours): 111 (model)	Tide Gate Type: flap gates
Discharge Size: 72" diameter	Discharge Invert: N/A
River Elevation: N/A	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  Pumphouse with two CSO outfalls 1. One large submerged outfall 2. Two directly from pump station Problem with river water entering submerged outfall	
Draw site/describe conditions:  Manhole (downstream of pump station of upstream siphon structure) surcharged; toilet paper, other identifiables at that location and in eroded area around manhole <div style="text-align: center; margin-top: 20px;">  <p>The sketch is a hand-drawn map. It shows a rectangular area representing a site. A line labeled 'Main' runs vertically on the left. A line labeled 'Camp Allen' runs horizontally at the bottom. A line labeled 'St. Mary's River' runs diagonally from the top right towards the center. A point is marked with a circle and labeled 'manhole'. An arrow points to this circle with the word 'submerged'. Another arrow points to an area near the riverbank labeled 'eroded area'. A small box labeled 'pump station' is located near the intersection of Main and Camp Allen.</p> </div>	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  Very little, identifiables at surcharged manhole, not at outfalls	
Date of Visit: 5/12 1:05 p.m.	Name: Phil Blonn

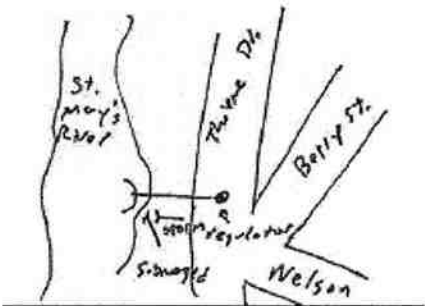
K06-233, K06-234



## K06-233, K06-234



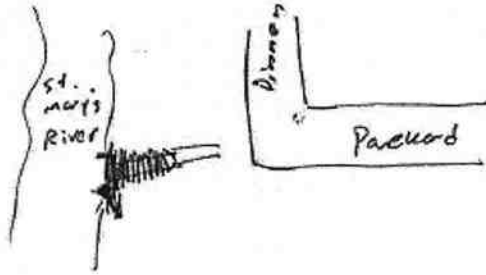
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 013	Location #: K06-298
Street Location: St. Mary's River at Thieme Dr., Nelson St. and Berry St.	Receiving Water: St. Mary's River
Subbasin: K06-090 A	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 5,830,632 (model)	CSO Annual Frequency (times/year): 52 model; no Jan.-Apr. data
CSO Annual Overflow (hours): 211 (model)	Tide Gate Type: tide gate
Discharge Size: 72"	Discharge Invert: N/A submerged
River Elevation: N/A	Last Precipitation: 5:00 p.m. yesterday
<p>Summarize site history:</p> <p>Has overflowed in past due to plugged up sewer lines; no identifiabes observed going into river</p>	
<p>Draw site/describe conditions:</p> <p>No identifiabes observed; some leaves; stormwater runoff debris; beer bottles; litter</p> <div style="text-align: center;">  </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>A few leaves</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>Beer bottles</p>	
Date of Visit: 5/12 12:45 p.m.	Name: Phil Blonn

K06-298



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 014	Location #: K07-106
Street Location: Packard and Dinnen	Receiving Water: St. Mary's River
Subbasin: K07-026	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 73,187 (model)	CSO Annual Frequency (times/year): 63 (model); 0 Jan.-Apr. data
CSO Annual Overflow (hours): 104 (model)	Tide Gate Type: None
Discharge Size: 12"	Discharge Invert: 743.3
River Elevation: 743+/- (low flow elev.)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  Most of the basin served by combined sewers, a few separate storm sewers along southern sections of Broadway	
Draw site/describe conditions:  <div style="text-align: center;">  </div>	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  Significant amount of litter; stormwater runoff material, leaves, etc. right below outfall before river	
Date of Visit: 5/12 9:45 a.m.	Name: Phil Blonn

K07-106



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 016	Location #: K07-109
Street Location: 3418 Broadway	Receiving Water: St. Mary's River
Subbasin: K07-026	Immediate Area Land Use (describe):  Commercial and residential
CSO Annual Volume (cf): 6,621 (model)	CSO Annual Frequency (times/year): 9 (model); 0 (Jan.-Apr. data)
CSO Annual Overflow (hours): 4 (model)	Tide Gate Type: none
Discharge Size: 12"	Discharge Invert: unknown
River Elevation: 743+/- (low flow elev.)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  Never has been observed overflowing	
Draw site/describe conditions:  Headwall completely collapsed; several sections of pipe broken and disconnected; severe erosion at current outfall point; no signs of identifiable sewage; debris at outfall looks like stormwater runoff debris; a lot of leaves, sediment	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  Large amounts (piles) of household garbage and litter among trees on shore of river	
Date of Visit: 5/12 11:00 a.m.	Name: Phil Blonn

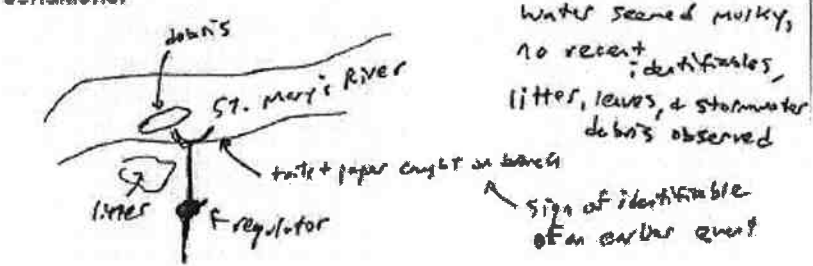
K07-109



K07-109



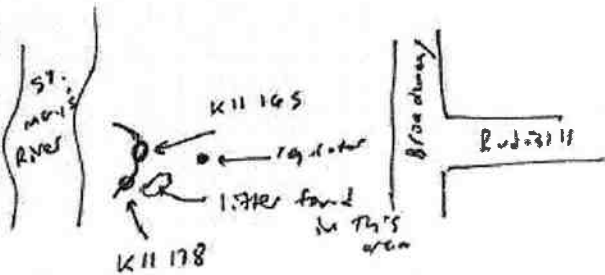
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 017	Location #: K07-176
Street Location: 2904 Wildmere	Receiving Water: St. Mary's River
Subbasin: K07-026	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 963,279 (model)	CSO Annual Frequency (times/year): 32 (model); 8 (Jan.-Apr. data)
CSO Annual Overflow (hours): 88 (model)	Tide Gate Type: flapgate
Discharge Size: 42" diameter	Discharge Invert: unknown
River Elevation: 743 +/- (low flow elev.)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  There has been observed overflow with identifiable debris in the past	
Draw site/describe conditions:  <div style="text-align: center;">  </div>	
Noted debris in water (type, size, quantify):  Litter caught on dead tree in water	
Noted debris on land (type, size, quantify):  Litter, pile of trash	
Date of Visit: 5/12 11:30 a.m.	Name: Phil Blonn

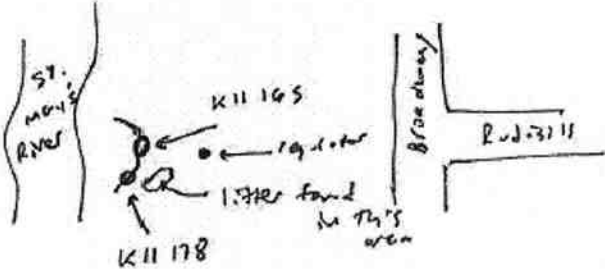
K07-176



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 018	Location #: K11-165
Street Location: near Broadway and Rudisill	Receiving Water: St. Mary's River
Subbasin: K11-010	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 51,159,119 (model)	CSO Annual Frequency (times/year): 84 (model); 8 (Jan.-Apr. data)
CSO Annual Overflow (hours): 470 (model)	Tide Gate Type: 12' x 12' tidegate
Discharge Size: 126"	Discharge Invert: 744.06'
River Elevation: 743+/-	Last Precipitation: 5:00 p.m. yesterday
<p>Summarize site history:</p> <p>This is about 40% of the total CSO volume for the city. See also data sheet 019 (K11-178).</p>	
<p>Draw site/describe conditions:</p> <div style="text-align: center;">  <p>The sketch is a hand-drawn map of the site. It shows the St. Mary's River on the left, flowing towards the bottom. Broadway street runs vertically on the right. Rudisill street runs horizontally at the bottom, intersecting Broadway. Two points are marked with dots: K11 165 is located near the intersection, and K11 178 is located further down Rudisill. A line labeled 'regulator' points to K11 165. Another line labeled '1.5HR pond in this area' points to a location between K11 165 and K11 178.</p> </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>See also data sheet 019 (K11-178).</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>See also data sheet 019 (K11-178).</p>	
Date of Visit: 5/12 10:20 a.m.	Name: Phil Blonn

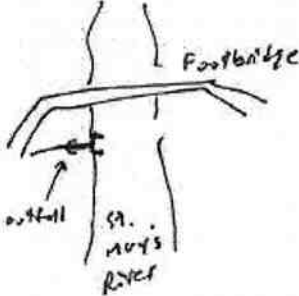
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 019	Location #: K11-178
Street Location: Near Broadway and Rudisill	Receiving Water: St. Mary's River
Subbasin: K11-010	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): included w/K11-165	CSO Annual Frequency (times/year): see K11-165; 5 (Jan.-Apr. data)
CSO Annual Overflow (hours):	Tide Gate Type: flapgate
Discharge Size: 42"	Discharge Invert: 745.75'
River Elevation: 743+/- (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:   Debris observed in past during heavy rains; bottles, toilet paper, leaves; a lot of storm hooked into this	
Draw site/describe conditions:  <div style="text-align: center;">  <p>A hand-drawn sketch of the site. On the left is a wavy line representing the 'ST. MARY'S RIVER'. To its right is a vertical line for 'Broadway'. Further right is a horizontal line for 'Rudisill'. Two points are marked: 'K11 165' and 'K11 178'. An arrow points from 'K11 165' to a note: '1.3112 found in this area'. Another arrow points from 'K11 178' to a small circle. A line connects 'K11 165' and 'K11 178' with the label 'regulator'.</p> </div>	
Noted debris in water (type, size, quantify):  Small amount of leaves	
Noted debris on land (type, size, quantify):  Small amount of litter; pop cans, bags, etc.	
Date of Visit: 5/12 10:20 a.m.	Name: Phil Blonn

# K11-165, K11-178



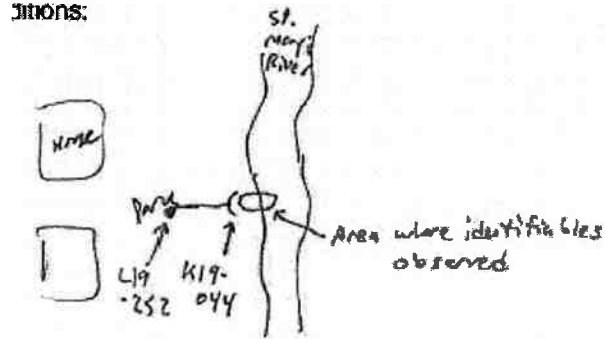
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 020 Street Location: near foot bridge to Foster Park West a couple of thousand feet west of this regulator on the east bank of St. Mary's River	Location #: K15-116 Receiving Water: St. Mary's River
Subbasin: K15-009	Immediate Area Land Use (describe):  Park
CSO Annual Volume (cf): 2,457,734 (model)	CSO Annual Frequency (times/year): 72 (model); 8 (Jan.-Apr. data)
CSO Annual Overflow (hours): 249	Tide Gate Type: internal flapgate u/s of outfall
Discharge Size: 6' x 6' box culvert	Discharge Invert: $\approx 744 \pm$
River Elevation: 744 $\pm$ (low flow elev.)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  River often backs up into system at this point, debris often gets clogged at internal flapgate	
Draw site/describe conditions:  No sign of debris at flapgate or regulator or outfall at time of visit	
	
Noted debris in water (type, size, quantify):  Small amount of leaves, plant debris	
Noted debris on land (type, size, quantify):  None	
Date of Visit: 5/12 10:00 a.m.	Name: Phil Blonn

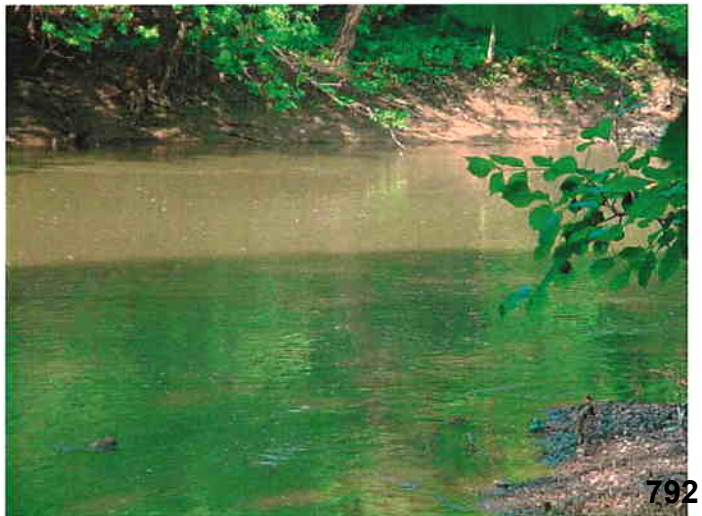
K15-116



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 021	Location #: K19-044
Street Location: 5340 Century Court	Receiving Water: St. Mary's River
Subbasin: L19-252	Immediate Area Land Use (describe):  Residential, park
CSO Annual Volume (cf): 1,425,564 (model)	CSO Annual Frequency (times/year): 56 (model); 10 (Jan.-Apr. data)
CSO Annual Overflow (hours): 344 (model)	Tide Gate Type: flapgate
Discharge Size: 66"	Discharge Invert: less than 1' above water level
River Elevation: 745 (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  Most combined sewers constructed in 1950s	
<p>Draw site/describe conditions:</p> <p style="text-align: center;">Sketch:</p> 	
<p>Noted debris in water (type, size, quantify):</p> <p>Plume of sewage; identifiablies, toilet paper, waste etc. on concrete and in water spillway; right at discharge point</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>None</p>	
Date of Visit: 5/12 9:00 a.m.	Name: Phil Blonn

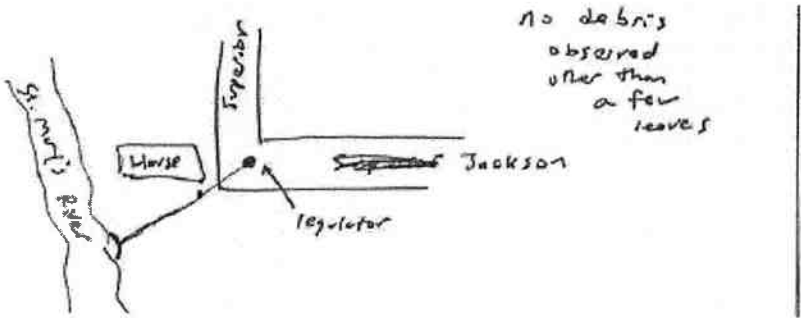
K19-044



K19-044



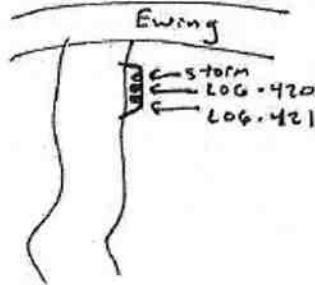
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 023	Location #: L06-103
Street Location: Jackson and Superior	Receiving Water: St. Mary's River
Subbasin: L06-078	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 267,138 (model)	CSO Annual Frequency (times/year): 54 (model); 6 (Jan.-Apr. data)
CSO Annual Overflow (hours): 20 (model)	Tide Gate Type: flapgate
Discharge Size: 48" diameter	Discharge Invert: unknown, bottom is submerged
River Elevation: 733 (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
<p>Summarize site history:</p> <p>Overflows with murky water have been observed, usually no identifiabiles; occasional river intrusion when water is real high and outfall is submerged</p>	
<p>Draw site/describe conditions:</p> <div style="text-align: center;">  </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>None</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>None</p>	
Date of Visit: 5/12 1:15 p.m.	Name: Phil Blonn

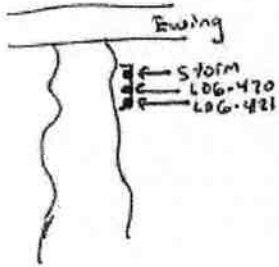
L06-103



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 024	Location #: L06-420
Street Location: Ewing and Superior	Receiving Water: St. Mary's River
Subbasin: L06-087	Immediate Area Land Use (describe):  Commercial
CSO Annual Volume (cf): 1,195,116 (model)	CSO Annual Frequency (times/year): 16 (model); 6 (Jan.-Apr. data)
CSO Annual Overflow (hours): 40	Tide Gate Type: flapgate
Discharge Size: 72" diameter	Discharge Invert: $\approx 733 \pm$
River Elevation: 733 (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
<p>Summarize site history:</p> <p>Identifiabiles observed in river during one event last year; submerged <math>\approx 50\%</math> of the time; leaks back into system when 50% submerged or more</p>	
<p>Draw site/describe conditions:</p> <p>No debris observed in area; water level at bottom of outfalls</p> <div style="text-align: center;">  </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>One pop bottle in water</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>None</p>	
Date of Visit: 5/12 1:30 p.m.	Name: Phil Blonn

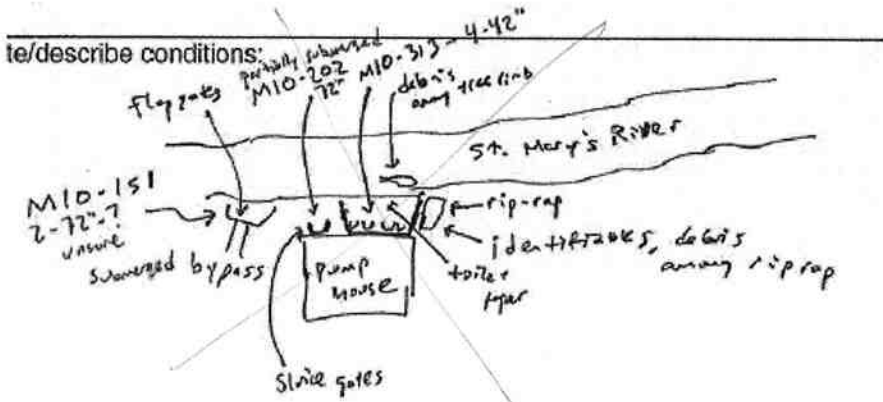
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 025	Location #: L06-421
Street Location: Ewing and Superior	Receiving Water: St. Mary's River
Subbasin: L06-086	Immediate Area Land Use (describe):  Commercial
CSO Annual Volume (cf): 48 (model)	CSO Annual Frequency (times/year): 1 (model); 5 (Jan.-Apr. data)
CSO Annual Overflow (hours): 1 (model)	Tide Gate Type: flapgate
Discharge Size: 60"	Discharge Invert: $\approx 733 \pm$
River Elevation: 733 (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
<p>Summarize site history:</p> <p>Identifiabiles observed in river during one event last year; submerged <math>\approx 50\%</math> of the time; leaks back into system when 50% submerged or more</p>	
<p>Draw site/describe conditions:</p> <p>No debris observed in area; water level at bottom of outfalls</p> <div style="text-align: right; margin-top: 20px;">  </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>One pop bottle in water</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>None</p>	
Date of Visit: 5/12 1:30 p.m.	Name: Phil Blonn

## L06-420, L06-421



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 026	Location #: M10-151
Street Location: 3 <sup>rd</sup> Street and Calhoun	Receiving Water: St. Mary's River
Subbasin: M10-120	Immediate Area Land Use (describe):  Residential and abandoned commercial/industrial
CSO Annual Volume (cf): 17,562,363 (model)	CSO Annual Frequency (times/year): 66 (model); no Jan.-Apr. data
CSO Annual Overflow (hours): 328 (model) <i>4-6' x 6' overflows</i>	Tide Gate Type: flapgates
Discharge Size: <del>2-72"</del> diameter	Discharge Invert: unknown
River Elevation: 738 (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  Most sewers built 1893-1930, rest in 1950; toilet paper, fecal, identifiables observed litter, stormwater runoff observed coming out when pumps are on	
Draw site/describe conditions:  Adjacent to Overflow Point #027 (Location # M10-202) and Overflow Point #033 (M10-313)  	
Noted debris in water (type, size, quantify):  Some identifiables, more on rip-rap	
Noted debris on land (type, size, quantify):  Identifiables, toilet paper on spillway, in rip-rap	
Date of Visit: 5/12 1:45 p.m.	Name: Phil Blonn

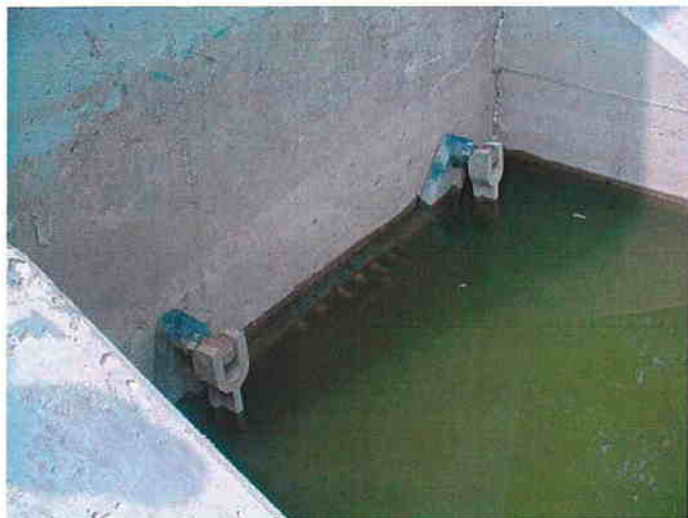
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 027	Location #: M10-202
Street Location: 3 <sup>rd</sup> Street and Calhoun	Receiving Water: St. Mary's River
Subbasin: M10-120	Immediate Area Land Use (describe):  Residential and abandoned commercial/industrial
CSO Annual Volume (cf): <del>17,562,363</del> (model) <i>555 026</i>	CSO Annual Frequency (times/year): 66 (model); no Jan.-Apr. data
CSO Annual Overflow (hours): 328 (model) <i>555 026</i>	Tide Gate Type: sluice gate <i>at FLAP C475</i>
Discharge Size: 1 $\approx$ 72" diameter	Discharge Invert: 734.77
River Elevation: 738 (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  Most sewers built 1893-1930, rest in 1950; toilet paper, fecal, identifiables observed litter, stormwater runoff observed coming out when pumps are on	
Draw site/describe conditions:  Adjacent to Overflow Point #026 (Location # M10-151) and Overflow Point #033 (M10-313)	
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>le/describe conditions:</p> </div> <div style="flex: 1; font-size: small;"> <p>St. Mary's River</p> <p>M10-151 2-72" valve surge bypass</p> <p>M10-202 72" fly rocks</p> <p>M10-313 4-42" debris among riprap</p> <p>pump house</p> <p>sluice gates</p> <p>riprap</p> <p>identifiables, debris among riprap</p> <p>toilet paper</p> </div> </div>	
Noted debris in water (type, size, quantify):  Some identifiables, more on rip-rap	
Noted debris on land (type, size, quantify):  Identifiables, toilet paper on spillway, in rip-rap	
Date of Visit: 5/12 1:45 p.m.	Name: Phil Blonn

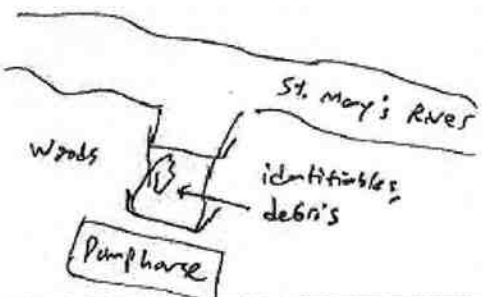
M10-202, M10-313, M10-151



# M10-202, M10-313, M0-151



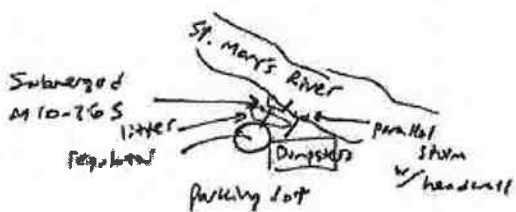
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 028	Location #: M10-238
Street Location: Griswald pump station	Receiving Water: St. Mary's River
Subbasin: M10-237	Immediate Area Land Use (describe):  Commercial; Institutional
CSO Annual Volume (cf): 471,877 (model)	CSO Annual Frequency (times/year): 15 (model); 4 (Jan.-Apr. data)
CSO Annual Overflow (hours): 24 (model)	Tide Gate Type: flapgate
Discharge Size: 30"	Discharge Invert: unknown
River Elevation: 738' (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  Remnants of identifiable debris usually found after pumps go on	
Draw site/describe conditions:  <div style="text-align: center;">  <p>The sketch shows a cross-section of the site. At the top, a wavy line represents the 'St. Mary's River'. Below it, on the left, is an area labeled 'Woods'. In the center, there is a rectangular structure labeled 'Pump house'. To the right of the pump house, an arrow points to a cluster of small circles labeled 'identifiable debris'.</p> </div>	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  Toilet paper caught in branches; 20 sq. ft. area of toilet paper caught on spillway	
Date of Visit: 5/12 2:25 p.m.	Name: Phil Blonn

M10-238



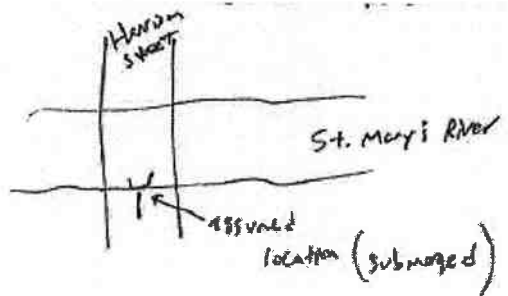
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 029	Location #: M10-265
Street Location: Duck Street and Bass Street	Receiving Water: St. Mary's River
Subbasin: M10-250	Immediate Area Land Use (describe):  Commercial
CSO Annual Volume (cf): 604,752 (256) (model); 29,491 (309) (model)	CSO Annual Frequency (times/year): 70 (256) (model); 26 (309) (model); 13 (Jan.-Apr. data);
CSO Annual Overflow (hours): 34 (256); 2 (309) (model)	Tide Gate Type: unknown
Discharge Size: 48"	Discharge Invert: 734.79'
River Elevation: 744-746 normal elev.	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  Some observed identifiables, toilet paper seen passing through regulator	
Draw site/describe conditions:  Submerged outfall, could not see it	
 <p>The sketch shows a cross-section of the site. At the top, a line represents the 'St. Mary's River'. Below it, a horizontal line indicates the 'Submerged M10-265' outfall. To the left of this line is a circle labeled 'Regulator'. Below the regulator is a rectangular area labeled 'Parking lot'. To the right of the submerged outfall is a vertical line labeled 'Storm w/ headwall'. The area between the submerged outfall and the storm drain is labeled 'Litter'.</p>	
Noted debris in water (type, size, quantify):  Some litter, a few bottles; large amount of litter, bottles, a volleyball in standing water inside regulator manhole	
Noted debris on land (type, size, quantify):  Miscellaneous litter	
Date of Visit: 5/12 2:10 p.m.	Name: Phil Blonn

M10-265



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 032	Location #: M10-306
Street Location: Harrison St. Bridge	Receiving Water: St. Mary's River
Subbasin: M06-711	Immediate Area Land Use (describe):  Commercial
CSO Annual Volume (cf): 183,098 (model)	CSO Annual Frequency (times/year): 5 (model); 7 (Jan.-Apr. data)
CSO Annual Overflow (hours): 44 (model)	Tide Gate Type: flapgate (?)
Discharge Size: 60" or 30" - ?	Discharge Invert: cannot locate, submerged
River Elevation: 738 (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
<p>Summarize site history:</p> <p>No observed identifiabiles, but some bubbles observed during an overflow near where location is assumed to be</p>	
<p>Draw site/describe conditions:</p> <p>Outfall submerged, not found under bridge somewhere</p> <div style="text-align: center;">  </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>1 beer can</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>Cardboard, clothing</p>	
Date of Visit: 5/12 1:35 p.m.	Name: Phil Blonn

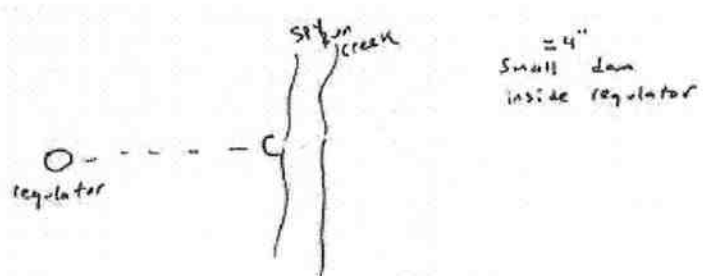
M10-306



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 033 Street Location: 3 <sup>rd</sup> Street and Calhoun	Location #: M10-313 Receiving Water: St. Mary's River
Subbasin: M10-120	Immediate Area Land Use (describe):  Residential and abandoned commercial/industrial
CSO Annual Volume (cf): <del>17,562,363</del> (model) <i>SEE 026</i>	CSO Annual Frequency (times/year): <del>66</del> <i>SEE 026</i> (model); no Jan.-Apr. data
CSO Annual Overflow (hours): <del>328</del> (model) <i>SEE 026</i>	Tide Gate Type: flapgates
Discharge Size: 4 - 42" diameter	Discharge Invert: 752.07
River Elevation: 738 (low water elev.)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  Most sewers built 1893-1930, rest in 1950; toilet paper, fecal, identifiables observed litter, stormwater runoff observed coming out when pumps are on	
Draw site/describe conditions:  <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;">           Adjacent to            Overflow Point #026            (M10-151) and            Overflow Point #027            (Location # M10-202)         </div> <div style="width: 60%;"> </div> </div>	
Photos follow data sheet 027.	
Noted debris in water (type, size, quantify):  Some identifiables, more on rip-rap	
Noted debris on land (type, size, quantify):  Identifiables, toilet paper on spillway, in rip-rap	
Date of Visit: 5/12 1:45 p.m.	Name: Phil Blonn


## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 036	Location #: M18-032
Street Location: 2315 Westbrook	Receiving Water: Spy Run Creek to St. Mary's River
Subbasin: M18-256	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 1,864,615 (model)	CSO Annual Frequency (times/year): 83 (model); 4 (Jan.-Apr. data)
CSO Annual Overflow (hours): 727 (model)	Tide Gate Type: flapgate
Discharge Size: 24"	Discharge Invert: 747.54
River Elevation: 740 (low water elev.)	Last Precipitation: 7:40 a.m.
Summarize site history:   No identifiabiles observed	
Draw site/describe conditions:  <div style="text-align: center;">  <p>The sketch shows a vertical line representing a creek, labeled 'Spy Run Creek' at the top. To the left of the creek, there is a circle labeled 'regulator'. A dashed line connects the regulator to the creek. To the right of the creek, there is a small dam structure labeled 'Small dam' and 'inside regulator'.</p> </div>	
Noted debris in water (type, size, quantify):  None, water looked very murky	
Noted debris on land (type, size, quantify):  None	
Date of Visit: 5/11 12:40 p.m.	Name: Phil Blonn

M18-032



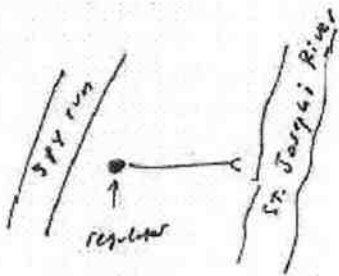
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 039	Location #: N06-022
Street Location: 721 Edgewater (we stopped); Hannah and Wayne; outfall at Hannah and Berry	Receiving Water: Maumee River
Subbasin: N06-007	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 3,051,243 (model)	CSO Annual Frequency (times/year): 40 (model)
CSO Annual Overflow (hours): 269 (model)	Tide Gate Type: N/A
Discharge Size: 60"	Discharge Invert: 761.5+/-
River Elevation: 740+/-	Last Precipitation: 7:40 a.m.
<p>Summarize site history:</p> <p>Most sewage is collected by combination sewers. The Wayne Street interceptor serves this subbasin.</p>	
<p>Draw site/describe conditions:</p> <p>Outfall location not accessible</p> <div style="text-align: center;">  </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>None</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>None</p>	
Date of Visit: 5/11 11:06 a.m.	Name: Phil Blonn

N06-022



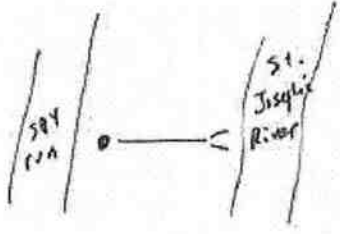
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 044	Location #: N22-093
Street Location: Dalgren and Spy Run	Receiving Water: St. Joseph's River
Subbasin: M18-261	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 9,510 (model)	CSO Annual Frequency (times/year): 3 (model); 4 (Jan.-Apr. data)
CSO Annual Overflow (hours): 13 (model)	Tide Gate Type: flapgate
Discharge Size: 12"	Discharge Invert: $\approx 745 \pm$
River Elevation: 743.5' (low water elev.)	Last Precipitation: 7:40 a.m.
Summarize site history:  Has not seen many overflows	
Draw site/describe conditions:  Regulator builds up about 1' before overflowing <div style="text-align: center; margin-top: 20px;">  </div>	
Noted debris in water (type, size, quantify):  Identifiables, toilet paper, minimal amount on rip rap immediately d/s of outfall	
Noted debris on land (type, size, quantify):  None	
Date of Visit: 5/11 2:00 p.m.	Name: Phil Blonn

N22-093




## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 045	Location #: N22-103
Street Location: Spy Run, 400' East of Dalgren	Receiving Water: St. Joseph's River
Subbasin: M18-261	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 8,680 (model)	CSO Annual Frequency (times/year): 3 (model); 4 (Jan.-Apr. data)
CSO Annual Overflow (hours): 2 (model)	Tide Gate Type: flapgate
Discharge Size: 10"	Discharge Invert: $\approx 745$ +/-
River Elevation: 743.5' (low water elev.)	Last Precipitation: 7:40 a.m.
Summarize site history:  Has not seen many overflows; some groundwater flow into system	
Draw site/describe conditions:  Regulator builds up about 1" before overflowing	
	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  Small amount of general litter; a few wrappers; green sludge on rip rap d/s of outfall	
Date of Visit: 5/11 2:07 p.m.	Name: Phil Blonn

N22-103



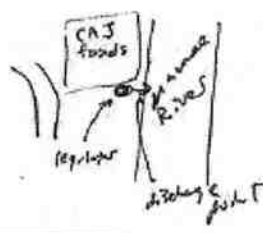
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 048	Location #: O10-252
Street Location: Morton Street Pump Station	Receiving Water: Maumee River
Subbasin: O10-101	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 11,305,463 (model)	CSO Annual Frequency (times/year): 63 (model); no Jan.-Apr. data
CSO Annual Overflow (hours): 256 (model)	Tide Gate Type: shut off valve
Discharge Size: 5", 30" discharges	Discharge Invert: 745.0'
River Elevation: 742+/- (low water elev.)	Last Precipitation: 7:40 a.m.
<p>Summarize site history:</p> <p>Overflows during large rain events; overflows are typically clear-looking sewage</p>	
<p>Draw site/describe conditions:</p> <p>Pump station, 4 pumps, 5 gates, 4 were open</p> <div style="text-align: center;">  </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>None</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>None</p>	
Date of Visit: 5/11 11:15 a.m.	Name: Phil Blonn

O10-252



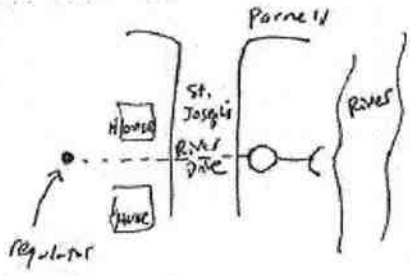
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 050	Location #: O10-277
Street Location: Coombs and Herbert	Receiving Water: Maumee River
Subbasin: 006-017	Immediate Area Land Use (describe):  Commercial
CSO Annual Volume (cf): 1,621,933 (model)	CSO Annual Frequency (times/year): 52 (model); 2 (Jan.-Apr. data)
CSO Annual Overflow (hours): 294 (model)	Tide Gate Type: 4'-5' wide flapgate in regulator MH and 36" flapgate at outfall
Discharge Size: 36" diameter brick	Discharge Invert: N/A, submerged
River Elevation: 738.0	Last Precipitation: 7:40 a.m.
Summarize site history:  No identifiabiles observed.	
Draw site/describe conditions:  Regulator overtops small dam in MH and then flapgate, but river water was flowing in at this point during visit; outfall site is not accessible <div style="text-align: center; margin-top: 20px;">  </div>	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  None	
Date of Visit: 5/11 10:55 a.m.	Name: Phil Blonn

O10-277



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 051	Location #: O22-094
Street Location: 1124 St. Joseph's River Drive	Receiving Water: St. Joseph's River
Subbasin: O22-092	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 291,092 (model)	CSO Annual Frequency (times/year): 10 (model); 5 (Jan.-Apr. data)
CSO Annual Overflow (hours): 26 (model)	Tide Gate Type: tide flex valve
Discharge Size: 18" diameter	Discharge Invert: 746.68
River Elevation: unknown $\approx$ 3-4' below invert	Last Precipitation: 7:40 a.m.
<p>Summarize site history:</p> <p>Sewers first constructed in area in 1945</p>	
<p>Draw site/describe conditions:</p> <p>Some identifiable debris on rocks immediately d/s of outfall</p> <div style="text-align: center;">  </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>Litter, cigarette butts, toilet paper, toilet paper on rip-rap immediately downstream of outlet port</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>Some street litter</p>	
Date of Visit: 5/11 2:45 p.m.	Name: Phil Blonn

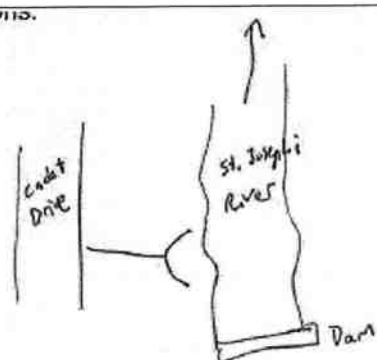
O22-094



O22-094



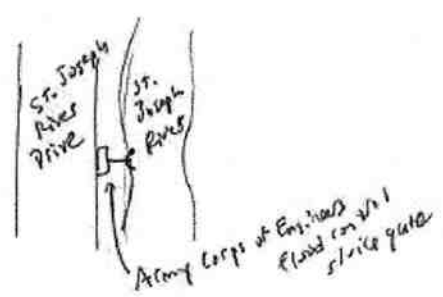
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 052	Location #: O22-004
Street Location: Cadet Drive behind Concordia Lutheran High School	Receiving Water: St. Joseph's River
Subbasin: O22-0618	Immediate Area Land Use (describe): Residential, school
CSO Annual Volume (cf): 453,625 (model); 328,777 (model)	CSO Annual Frequency (times/year): 45,17 (model); 7 (Jan.-Apr. data)
CSO Annual Overflow (hours): 231 (model); 27 (model)	Tide Gate Type: flapgate
Discharge Size: 48"	Discharge Invert: 749.58
River Elevation: 738.50	Last Precipitation: 7:40 a.m.
<p>Summarize site history:</p> <p>Sewers built in area in 1945</p>	
<p>Draw site/describe conditions:</p> <div style="text-align: center;">  <p>The sketch shows a vertical line on the left labeled 'Cadet Drive'. To its right is a horizontal line representing a road or boundary. Further right is a wavy vertical line labeled 'St. Joseph's River'. At the bottom of the river is a rectangular structure labeled 'Dam'. An arrow points upwards from the river, indicating flow direction.</p> </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>Paper towels stuck in flapgate</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>None</p>	
Date of Visit: 5/11 2:30 p.m.	Name: Phil Blonn

O22-004



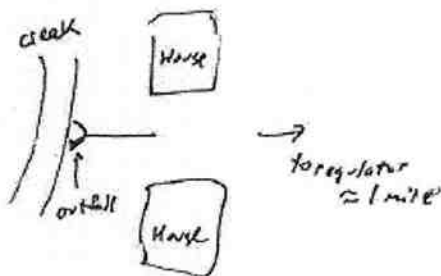
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 053	Location #: O22-002
Street Location: 1324 St. Joseph's River Drive	Receiving Water: St. Joseph's River
Subbasin: O22-092	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 134,659 (model)	CSO Annual Frequency (times/year): 9 (model); 5 (Jan.-Apr. data)
CSO Annual Overflow (hours): 19 (model)	Tide Gate Type: flapgate
Discharge Size: 42" diameter	Discharge Invert: unknown
River Elevation: unknown $\approx$ 5' below discharge invert	Last Precipitation: 7:40 a.m.
Summarize site history:  No indications of overflows	
Draw site/describe conditions:  <div style="text-align: center; margin-top: 20px;">  </div>	
Noted debris in water (type, size, quantify):  General litter; no identifiable sewer debris	
Noted debris on land (type, size, quantify):  Small pile of litter; pile of litter from storm runoff; see photo	
Date of Visit: 5/11 2:30 p.m.	Name: Phil Blonn

O22-002



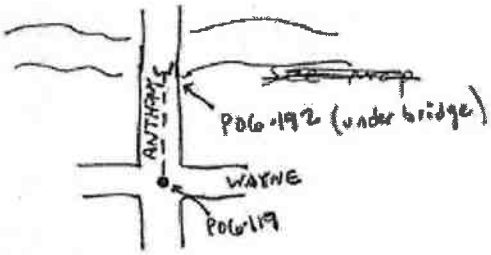
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 054	Location #: O23-080
Street Location: 1274 Farwood	Receiving Water: ditch, then St. Mary's River
Subbasin: N23-078	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 511,038 (model)	CSO Annual Frequency (times/year): 27 (model); 5 (Jan.-Apr. data)
CSO Annual Overflow (hours): 100 (model)	Tide Gate Type: none
Discharge Size: 48" diameter	Discharge Invert: 772.2
River Elevation: 744 +/-	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:  Area built in two sections in 1950 and 1951	
Draw site/describe conditions:  <div style="text-align: center;">  <p>The sketch shows a vertical line on the left labeled 'creek'. To its right are two rectangular boxes, each labeled 'House'. A horizontal line with an arrow points from the creek area to the houses, labeled 'outfall'. Further to the right, another horizontal line with an arrow points towards the text 'regulator ~ 1 mile'.</p> </div>	
Noted debris in water (type, size, quantify):  None; some identifiables in brush downstream of outflow	
Noted debris on land (type, size, quantify):  None	
Date of Visit: 5/12 8:30 a.m.	Name: Phil Blonn

O23-080



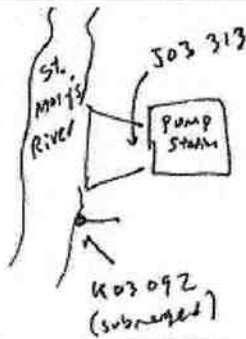
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 055	Location #: P06-192
Street Location: Anthony and Wayne	Receiving Water: Maumee River
Subbasin: P06-119	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): 2,959,476 (model)	CSO Annual Frequency (times/year): 62 (model); 7 (Jan.-Apr. data)
CSO Annual Overflow (hours): 515 (model)	Tide Gate Type: flapgate
Discharge Size: 48" diameter	Discharge Invert: unknown, $\approx$ 2-3' above water level
River Elevation: 731.5 (normal water elevation)	Last Precipitation: 7:40 a.m.
<p>Summarize site history:</p> <p>Solids and identifiabls have been observed by staff during overflows; was not overflowing during visit</p>	
<p>Draw site/describe conditions:</p> <p>Overflow water usually clear, some groundwater, stormwater gets in past regulator, flapgate was discharging a trickle of flow during visit, regulator in system of MH's at Anthony and Wayne intersection.</p> <div style="text-align: center;">  </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>None</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>None</p>	
Date of Visit: 5/11 10:40 a.m.	Name: Phil Blonn

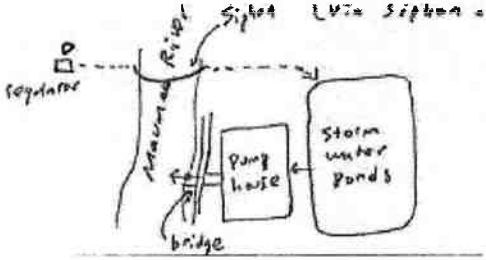
P06-192



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 056	Location #: J03-313
Street Location: Brown Street Pump Station Regulator; 1800 Brown Street South Side of Brown Street just east of Electric Avenue	Receiving Water: St. Mary's River
Subbasin: J03-012	Immediate Area Land Use (describe): Residential
CSO Annual Volume (cf): <del>63,215 (model)</del> SEE 007                      SEE 007	CSO Annual Frequency (times/year): <del>10 (model)</del> no Jan.-Apr. data      SEE 007
CSO Annual Overflow (hours): <del>10 (model)</del>	Tide Gate Type: flapgate
Discharge Size: 2-36" diameter	Discharge Invert: 752.75
River Elevation: 735.0 (normal)	Last Precipitation: 5:00 p.m. yesterday
Summarize site history:	
Identifiable residential sanitary sewage observed at this site in the past, not on this visit	
Draw site/describe conditions:	
<p>Adjacent to Overflow Point 007, Location # K03-092</p> <p>Photos follow data sheet 007.</p>	
 <p>The sketch shows a vertical line representing the St. Mary's River. To the right of the river is a rectangular box labeled 'Pump Station'. An arrow points from the river to the pump station, with 'J03 313' written above it. Below the pump station, another arrow points to a small circle on the riverbank, labeled 'K03 092 (submerged)'.</p>	
Noted debris in water (type, size, quantify):	
None	
Noted debris on land (type, size, quantify):	
Small amount of litter	
Date of Visit: 5/12 11:45 a.m.	Phil Blonn

## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 057	Location #: P10-121
Street Location: Wayne and Glasgow Regulator	Receiving Water: Storm Pond, then Maumee River
Subbasin: P06-014	Immediate Area Land Use (describe): Stormwater ponds, school, residences
CSO Annual Volume (cf): 8,673,828 (model)	CSO Annual Frequency (times/year): 45 (model); 4 (Jan. – Apr. data)
CSO Annual Overflow (hours): 128 (model)	Tide Gate Type: heavy duty flapgates
Discharge Size: 96" dia; 3 – 84" x 84" boxes	Discharge Invert: 734.25
River Elevation: 732 +/-	Last Precipitation: 7:40 AM
Summarize site history: Identifiable debris can be observed in water, but difficult to know if source is the overflow point	
<p>Draw site/describe conditions:</p> <p>Mechanical regulator gate, chained permanently open, doesn't work, small dam, if overtopped, flow goes to stormwater pump station on other side of river (via siphon under river). Flow can then either be pumped into pond or allowed to flow in to the river through openings in wet well.</p> <div style="text-align: center;">  <p>The diagram is a hand-drawn sketch of the site. It shows a vertical line representing the 'Maumee River'. On the left side of the river, there is a small square labeled 'regulator'. A dashed line with an arrow points from the river to a box labeled 'pump house'. This line is labeled 'Siphon via siphon'. Below the river line, there is a label 'bridge'. To the right of the pump house is a larger rectangle labeled 'Storm water pond'. Arrows indicate the flow of water from the river, through the siphon to the pump house, and then into the storm water pond.</p> </div>	
Noted debris in water (type, size, quantify):	
Condom, floatable biosolids, organic matter	
Noted debris on land (type, size, quantify):	
None	
Date of Visit: 5/11 10:00 a.m.	Name: Phil Blonn

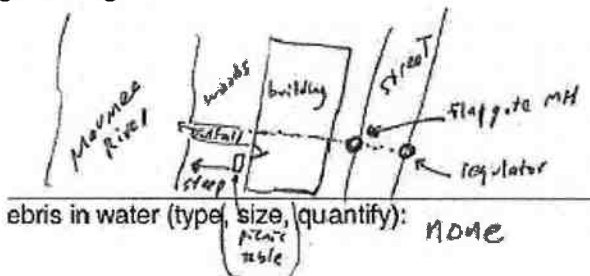
P10-121



P10-121



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 058	Location #: Q06-034
Street Location: Dwenger and Edsall 300' west of Edsall	Receiving Water: Maumee River
Subbasin: Q06-049	Immediate Area Land Use (describe):  Industrial
CSO Annual Volume (cf): 47,734	CSO Annual Frequency (times/year): 3 (model); 2 (Jan.-Apr. data)
CSO Annual Overflow (hours): 4 (model)	Tide Gate Type: flapgate at Q06-035
Discharge Size: 24" diameter	Discharge Invert: ? several feet above river
River Elevation: ? $\approx 733 \pm$	Last Precipitation: 7:40 a.m.
Summarize site history:  Older industrial area; no indication of overflows	
<p>Draw site/describe conditions:</p> <p>CSO regulator at street, connects to MH with flapgate, then open system to river, outfall located at river behind industrial building in wooded, steeply declining area, employees taking a break behind building, smoking, eating</p> <div style="text-align: center;">  <p style="margin-left: 100px;">debris in water (type, size, quantify): none</p> </div>	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  Several pop cans, bottles	
Date of Visit: 5/11 8:45 a.m.	Name: Phil Blonn

Q06-034



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 060 Street Location: 3333 Maumee Avenue North of Maumee between Edsall and Kitch	Location #: R06-031 Receiving Water: Open ditch to Maumee River
Subbasin: Q06-002	Immediate Area Land Use (describe):  Industrial, dumps
CSO Annual Volume (cf): 255,572 (model)	CSO Annual Frequency (times/year): 47 (model); 5 (Jan.-Apr. data)
CSO Annual Overflow (hours): 218 (model)	Tide Gate Type: flapgate
Discharge Size: 42" diameter	Discharge Invert: unknown
River Elevation: 731.50	Last Precipitation: 7:40 a.m.
Summarize site history:  Discharge water is often rusty color, possibly due to auto junkyard	
Draw site/describe conditions: <div style="text-align: center;"> <p style="font-size: small;">                         n site/describe conditions:                          scrap metal junkyard                          auto junkyard                          gravel road                          industrial area                          system discharges to open ditch                          discharge point ← was submerged                          small dam 3" deep by 6" high                          in regulator to prevent low flows                          route to plant, when dam overflows,                          flow goes to open ditch                          illegal dump site                          gas                          junkyard                          spoil yard                          River                          dam elevation = 715.51                     </p> </div>	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  Large dump of miscellaneous garbage on land next to ditch	
Date of Visit: 5/11 9:10 a.m.	Name: Phil Blonn

R06-031



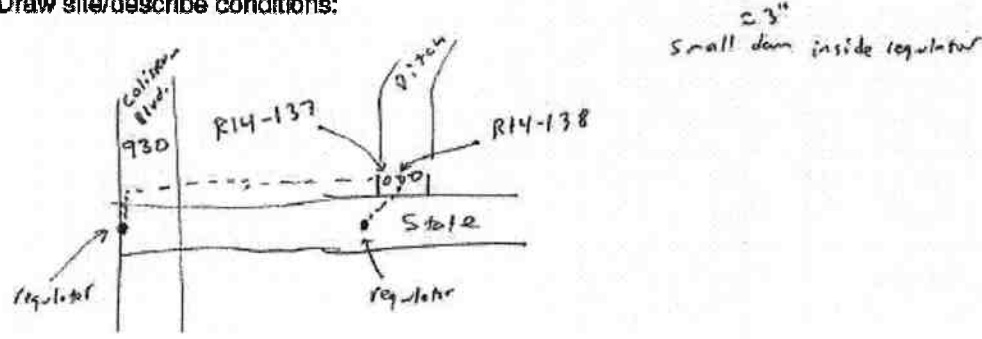
R06-031



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 061	Location #: R14-137
Street Location: Laverne and State	Receiving Water: open ditch to stormwater ponds to Maumee River
Subbasin: R14-033	Immediate Area Land Use (describe):  Commercial
CSO Annual Volume (cf): 295,426 (model)	CSO Annual Frequency (times/year): 6 (model); 8 (Jan.-Apr. data)
CSO Annual Overflow (hours): 20 (model)	Tide Gate Type: none
Discharge Size: 42"	Discharge Invert: $\approx 765+/-$
River Elevation: 733' (low water elevation)	Last Precipitation: 7:40 a.m.
Summarize site history:  No identifiables observed.	
<p>Draw site/describe conditions:</p> <div style="text-align: center;"> <p>Draw site/describe conditions:</p> </div>	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  None	
Date of Visit: 5/11 11:45 a.m.	Name: Phil Blonn

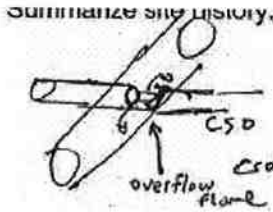
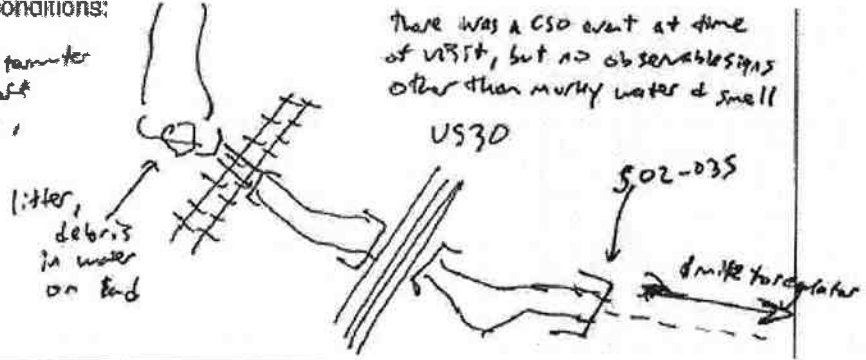
## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 062	Location #: R14-138
Street Location: Laverne and State	Receiving Water: Maumee River via Baldwin Ditch
Subbasin: R14-075	Immediate Area Land Use (describe):  Commercial
CSO Annual Volume (cf): 834,303 (model)	CSO Annual Frequency (times/year): 7 (model); 6 (Jan.-Apr. data)
CSO Annual Overflow (hours): 21 (model)	Tide Gate Type: flapgate
Discharge Size: 60"	Discharge Invert: 762.66+/-
River Elevation: 733+/- (low water elev.)	Last Precipitation: 7:40 a.m.
Summarize site history:  Seldomly overflows	
<p>Draw site/describe conditions:</p> <p style="margin-left: 40px;">Draw site/describe conditions:</p> <div style="text-align: center;">  <p style="margin-left: 100px;">23" Small dam inside regulator</p> </div>	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  None	
Date of Visit: 5/11 11:45 a.m.	Name: Phil Blonn

## R14-137, R14-138



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 064	Location #: S02-035
Street Location: New Haven Avenue and Coliseum Boulevard	Receiving Water: Unnamed ditch, then Maumee River
Subbasin: Q06-202	Immediate Area Land Use (describe):  Commercial/Residential, Industrial, open space
CSO Annual Volume (cf): 697,941 (model)	CSO Annual Frequency (times/year): 94 (model); 7 (Jan.-Apr. data)
CSO Annual Overflow (hours): 588 (model)	Tide Gate Type: None
Discharge Size: 120" diameter	Discharge Invert: $\approx 747.0'$
River Elevation: unknown	Last Precipitation: 5:00 p.m. yesterday
<p>Summarize site history:</p> <p>A lot of stormwater in this part of system, CSO water gets in through connection where CSO is a half-pipe line crossing through storm and spilling over (see diagram)</p> <div style="text-align: right;">  </div>	
<p>Draw site/describe conditions:</p> <p>There was a CSO event at the time of visit, but no observable signs other than murky water and smell.</p> <div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> <p>raw site/describe conditions:</p> <p>litter, debris, stormwater runoff observed, murky water no identifiable sewage other than smell</p> </div> <div style="flex: 2;">  <p>There was a CSO event at time of visit, but no observable signs other than murky water &amp; smell</p> </div> </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>Some litter</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>Some litter</p>	
Date of Visit: 5/12 2:30 p.m.	Name: Phil Blonn

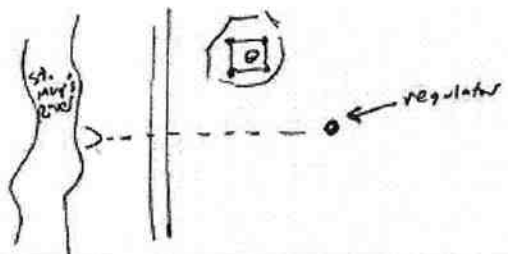
**Combined Sewer Overflow Solids/Floatables Control Data Sheet**

S02-035



S02-035



Overflow Point #: 067	Location #: K19-077
Street Location: Foster Park at Hartman Road	Receiving Water: St. Mary's River
Subbasin: K15-112	Immediate Area Land Use (describe): Park, ball fields
CSO Annual Volume (cf): 215,375 (model)	CSO Annual Frequency (times/year): 96 (model) (likely high); 0 (Jan.-Apr. data)
CSO Annual Overflow (hours): 527 (model)	Tide Gate Type: flapgate
Discharge Size: 24"	Discharge Invert: N/A; guess $\approx 748-752+/-$
River Elevation: $\approx 744+/-$	Last Precipitation: 5:00 p.m. yesterday
<p>Summarize site history:</p> <p>Observed at regulator that it had overflowed, likely during last night's rain event; no sign of debris at outfall; small trickle at flow coming out of it; according to city; groundwater gets into system and flows out at this point</p>	
<p>Draw site/describe conditions:</p> 	
<p>Noted debris in water (type, size, quantify):</p> <p>None</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>Some loose bricks</p>	
Date of Visit: 5/12 9:30 a.m.	Name: Phil Blonn

K19-077



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #: 068	Location #: N18-254
Street Location: Northside and Glazier	Receiving Water: St. Joseph River
Subbasin: N22-005	Immediate Area Land Use (describe):  Residential
CSO Annual Volume (cf): no model info	CSO Annual Frequency (times/year): 2 (Jan.-Apr. data)
CSO Annual Overflow (hours):	Tide Gate Type: sluice gate
Discharge Size: 36" diameter	Discharge Invert: 743.7'
River Elevation: 737.50' (normal water elev.)	Last Precipitation: 7:40 a.m.
Summarize site history:  Overflows in past	
<p>Draw site/describe conditions:</p> <div style="text-align: center;"> <p>St. Joe River      Army Corps flood control sluice gate      ~ 1' high dam within regulator</p> <p>levee      Northside      regulator</p> </div>	
<p>Noted debris in water (type, size, quantify):</p> <p>Identifiabiles, toilet paper, etc.; solids on rip-rap immediately d/s of outfall</p>	
<p>Noted debris on land (type, size, quantify):</p> <p>None; couch on top of levee</p>	
Date of Visit: 5/11 1:30 p.m.	Name: Phil Blonn

N18-254



## Combined Sewer Overflow Solids/Floatables Control Data Sheet

Overflow Point #:	Location #: P10-011
Street Location: Northeast of intersection of Pemberton and Niagara at the Maumee River	Receiving Water: Maumee River
Subbasin: residential school	Immediate Area Land Use (describe): Residential; school
CSO Annual Volume (cf): N/A	CSO Annual Frequency (times/year): 5 (Jan.-Apr. data)
CSO Annual Overflow (hours): N/A	Tide Gate Type: tidegate at headwall, sluice gate at MH P10-173
Discharge Size: 60" x 66" concrete sewer	Discharge Invert: 734.06
River Elevation: 732.23	Last Precipitation: 7:40 a.m.
Summarize site history:  Overflows several times a year	
Draw site/describe conditions:  About one mile from regulators to outfall, a lot of stormwater tapped into system	
Noted debris in water (type, size, quantify):  None	
Noted debris on land (type, size, quantify):  None	
Date of Visit: 5/11 10:15 a.m.	Name: Phil Blonn

P10-001



## **Nine Minimum Controls – No. 6**

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### **EXHIBIT F-2**

# CSO Solids and Floatables Control Plan for Selected Sites



Prepared for



City of Fort Wayne  
Board of Public Works



Prepared by  
**CH2MHILL**  
November 2004

# **City of Fort Wayne**

## **CSO Solids and Floatables Control Plan for Selected Sites**

Final Report

Prepared for  
The City of Fort Wayne Board of Public Works  
920 City-County Building, One Main Street  
Fort Wayne, IN 46802

Prepared by



2225 Dwenger Avenue  
Fort Wayne, Indiana 46803

November 2004



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## **1. Introduction**



# 1. Introduction

To assist the City of Fort Wayne in its ongoing long term control plan for minimizing CSOs, 44 CSO sites within the City were observed by CH2M HILL staff during the week of May 10th, 2004. As a result of this effort, four CSO locations (presented in Table 1) were identified as having a possible near-term need for solids and floatables control.

**TABLE 1**  
CSO Sites Recommended for Further Investigation of Solids and Floatables Control

Overflow Point	Location Number	Street Location	Receiving Water	Discharge Size (in.)
017	K07-176	Waldron Circle/ Wildwood Avenue	St. Mary's River	42
021	K19-044	Old Mill & Fairfax/ Foster Park	St. Mary's River	66
026 027 033	M10-151 M10-202 M10-313	3rd Street and Calhoun/ Third Street Pump Station	St. Mary's River	One 72 and one 84 One 72 Four 42
052	O22-004	St. Joseph River Drive/ Concordia High School Access Road	St. Joseph River	48

Available technologies and approaches to CSO control are numerous and a broad initial list of candidate CSO technologies was developed to encompass many potential control objectives.

## 1.1 CSO Program Overview

CSO control technologies can be grouped into five general classifications:

- Sewer system optimization (regulator modifications; in-system storage)
- Inflow reduction (upstream stormwater storage; stormwater sumps; sewer separation; flow slippage; infiltration reduction)
- Storage (tanks; conduits; flow balancing)
- Source control (street sweeping; catch basin cleaning; sewer flushing; improved land use; public education programs)
- Treatment (booms; nets; baffles; screens; vortex separators; sedimentation)

Selecting the most appropriate technology or mix of technologies for a site or a sewer system depends on a variety of technical, environmental, and implementation factors. Sewer system optimization, inflow reduction, and storage are focused primarily around CSO quantity reduction where as source control and treatment are focused primarily around improving CSO quality.

The City of Fort Wayne is currently developing a long-term CSO control plan for its combined sewer system which includes technologies from the above groups. Additional wet weather conveyance is planned to convey the southern CSOs (along the Saint Mary River) and the CSOs along the Maumee River to the City of Fort Wayne water pollution control facility (WPCF). The drainage areas tributary to the northern CSOs along the Saint Joseph River may be scheduled for separation. A separate project is currently reviewing maximization of the existing system for storage and conveyance of flows to the WPCF. This project, the solids and floatables control project, will focus on source controls and treatment to physically remove solids and floatables from CSOs.

## **1.2 Site Descriptions**

### **CSO 017 (Location #K07-176, Subbasin #K07-026, (Waldron Circle/Wildwood Avenue)**

The 110-acre subbasin tributary to CSO 017 is 86 percent residential and 14 percent commercial. Residential property ( $\frac{1}{4}$  to  $\frac{1}{2}$  acre in size) is in close proximity to the regulator (#K07-171) and CSO. The regulator and CSO are located in the northwestern corner of the subbasin on the St. Mary's River. A City of Fort Wayne Sewer Utility Map of the area (Map No. K07, 2001) identifies the subbasin as 100 percent combined sewers.

A 42-inch combined sewer parallels the access road before it enters the regulator chamber. There is a weir inside the chamber which diverts dry weather flow away from the 42-inch CSO and toward the double barrel (10-inch and 8-inch) siphon under the St. Mary's River. There is a float-operated mechanical gate inside the structure that can be adjusted to open/close the gate at a specific water elevation in the chamber. There is about a 20-foot wide multiple resident driveway that serves as an access road to the regulator and CSO. The CSO discharges about 50 feet from the regulator.

### **CSO 021 (Location #K19-044, Subbasin #L19-252, Fairfax Avenue/Foster Park)**

The 330-acre subbasin tributary to CSO 021 is 68 percent residential, 14 percent commercial, and 10 percent open space. The regulator (#L19-018) is located in a small grove of trees in between two residential properties ( $\frac{3}{4}$  acre in size). The regulator and CSO are located on the western edge of the subbasin on the St. Mary's River. The CSO is located roughly 450 feet southwest of the regulator at the southern end of Foster Park. A City of Fort Wayne Sewer Utility Map of the area (Map No. L19, 2001) identifies the subbasin as predominantly combined sewers with some separated sewers in the southern and eastern portions of the subbasin.

A 66-inch combined sewer parallels Fairfax Avenue before it enters the regulator chamber. There is a weir inside the chamber which diverts dry weather flow away from the 66-inch CSO and toward a 24-inch interceptor sewer. There is a float-operated mechanical gate on the regulator discharge that can be adjusted to open/close the gate at a specific water elevation in the chamber.

### **CSO 026/027/033 (Location #M10-151, #M10-202, #M10-303, Subbasin #M10-150, Third Street Pump Station)**

The 833-acre subbasin tributary to CSOs 026/027/033 is 73 percent residential, 10 percent commercial, 10 percent institutional/industrial, and 10 percent open space. The overflow from regulator M10-150 goes to CSO 026/M10-151. The overflow from regulator M10-199 goes to CSO 027/M10-202 and CSO 033/M10-303. The regulators and CSOs are located on the west bank of the St. Mary's River on city-owned property. A residential neighborhood is across the street. A paved greenway recreation trail parallels the river.

#### **CSO 026 / M10-151**

Of these three CSOs, CSO 026 is the northeasternmost. CSO 026 is a submerged discharge and consists of two 4-foot-square head wall openings with flap gates and two 4.5- by 6-foot head wall openings with flap gates. CSO 026 receives the overflow from regulator M10-150. Regulator M10-150 receives flow from regulator M10-148 through an 84-inch pipe and regulator M10-199 through a 72-inch pipe. Both the 84- and 72-inch pipes have hydraulic sluice gates located between upstream regulators M10-148 and M10-199 and downstream regulator M10-150. The sluice gates are maintained in the open position.

#### **CSO 027 / M10-202**

CSO 027 is a submerged discharge, just southwest of CSO 026. Regulator M10-199 diverts wet weather flows over a weir through a 108-inch pipe to structure M10-201, where the flow is discharged through either a 72-inch pipe to CSO 027 or through the Third Street Pump Station. A hydraulic sluice gate on the 72-inch pipe is maintained in the closed position. Therefore, CSO 027 is maintained to have zero discharge and functions as an emergency bypass for the pump station.

#### **CSO 033 / M10-313**

CSO 033/M10-313 is a pump station discharge, just southwest of CSO 027. Regulator M10-199 diverts wet weather flows over a weir through a 108-inch pipe to structure M10-201, where the flow is discharged through either a 72-inch pipe or through the Third Street Pump Station to CSO 033. The pump station has bar screens with 2-inch spacing. CSO 033 consists of four 42-inch outfall pipes.

### **CSO 052 (Location #O22-004, Subbasin # O22-061B, Concordia High School Access Road)**

The 176-acre subbasin tributary to CSO 052 is 62 percent residential, 15 percent commercial, 15 percent institutional, and 8 percent open space. Institutional and commercial properties are in the immediate vicinity. The regulator and CSO are located in the northwestern corner of the subbasin. A City of Fort Wayne Sewer Utility Map of the area (Map No. P22, 2001) identifies the subbasin as mixed combined and separate sewers.

Regulator P22-001 diverts wet weather flow from the east side of Anthony Boulevard to the west side of Anthony Boulevard through a 30-inch pipeline. Regulator P22-139 diverts wet weather flow from the east side of Crescent Avenue to the west side of Crescent Avenue through a 24-inch pipe. The 24-inch pipe runs along St. Joe River Drive to Anthony Boulevard, where it combines with a 48-inch separate storm sewer. The combined sewer

flows then run north along Anthony Boulevard through a 54-inch pipe that combines with the 30-inch overflow pipe from Regulator P27-001 at Manhole 027-005. A 42-inch pipeline exits manhole 022-005 and flows roughly 500 feet northwest to CSO 052. CSO 052 is located on the northwest side of Concordia Lutheran High School Access Road and the southern side of the St. Joseph River.

## **2. Solids and Floatables Control Alternatives**



## 2. Solids and Floatables Control Alternatives

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### 2.1 Non-structural Source Control Best Management Practices

Source controls are characterized by nonstructural techniques and programs that aim to reduce pollutant loading by intercepting or preventing the accumulation of contaminants before they enter the overflow stream. Although this strategy would not reduce or eliminate the solids and floatables associated with the sanitary sewage, it could help control the discharge of the considerable amounts of debris resulting from surface wash during storms. Studies in New York City have shown that street litter and debris can make up as much as 95 percent of the volume of CSO solids and floatables. Thus, this technique may be applicable for reducing the overall mass of solids and floatables and thus reduce the aesthetic problems and nuisances associated with this waste stream.

Because the techniques are not “end-of-pipe” solutions, this control strategy is not associated with particular outfalls. However, it is possible that the level of effort can be adapted for particular drainage areas to ensure that outfalls, which typically are problematic with respect to solids and floatables, are provided with more intensive efforts to relieve the problem.

The City of Fort Wayne has several source control programs in place:

- Street sweeping program
- Catch basin and inlet cleaning program
- Recycling program
- “Great America Clean Up” program
- “Tox-Away” program
- Hazardous spill response team
- Industrial pretreatment program
- Combined sewer flushing
- Trash collection and public education

Each program is described briefly below with estimates of its performance as provided by the Division of Sewer Maintenance.

#### Street Sweeping Program

Street sweeping reduces the amount of debris entering combined and storm sewers by collecting it prior to entry. This type of control is applicable to highly developed and established urban areas with curbed streets. Added benefits of street sweeping are the reduction of grit and heavy metals that can be easily transported to the receiving stream. Fort Wayne utilizes vacuum sweepers which have higher efficiency than mechanical sweepers.

In addition to the vacuum sweepers, Fort Wayne has a downtown “clean team” created in 1999 to clean alleys, sidewalks, and streets of solid and floatable materials to beautify the downtown area. The effort also helps prevent these items from entering the combined and

storm collection systems. Table 2 summarizes the curb miles swept and 33-gallon trash bags collected filled from clean team.

**TABLE 2**  
Clean Team Street Sweeping Program Annual Collection Summary

Year	Curb Miles Swept	33-Gallon Trash Bags Collected	Amount Collected (gal.)
1997	15,068		
1998	12,002		
1999	15,924		
2000	15,900		
2001	15,614	45	1,485
2002	14,375	37	1,221
2003	15,600	16	528
<b>Annual Average</b>	<b>14,926</b>	<b>33</b>	<b>1,078</b>

### Catch Basin and Inlet Cleaning Program

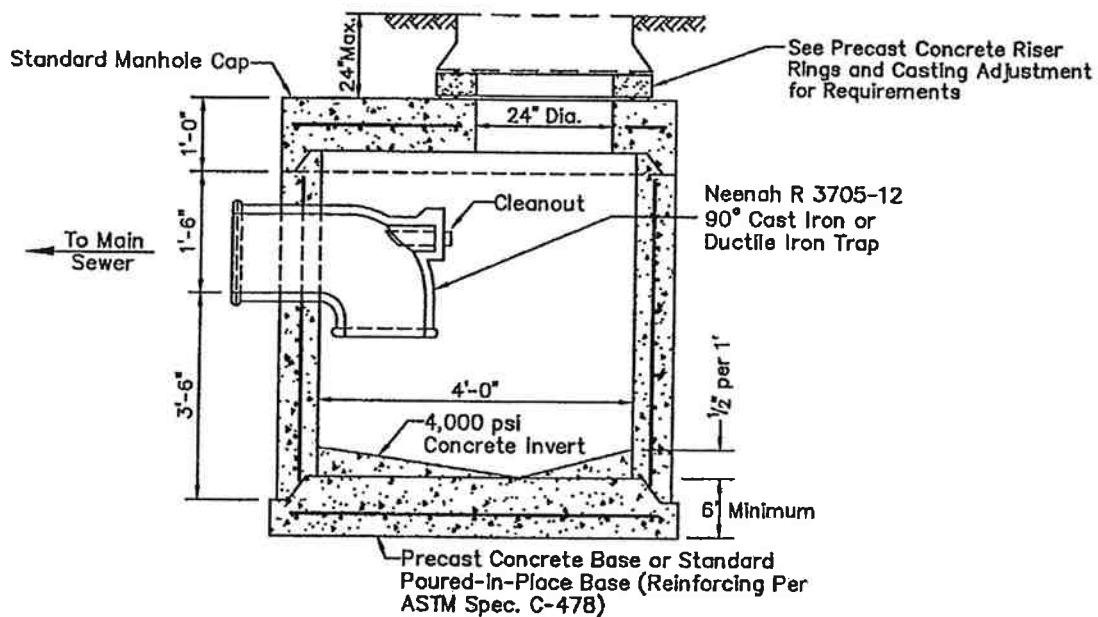
Frequent removal of accumulated catch basin deposits is a method often proposed in CSO control programs to reduce the heavy "first flush" effect of deposited solids from stormwater flows and to help reduce sediment buildup accumulating in the catch basins. Although determining the effectiveness of this control strategy is difficult, it is relatively easy to implement and requires minimal capital cost. This program addresses cleaning of roughly 15,500 known structures within a 2½-year cleaning cycle. Figure 1 depicts the standard design used in 90 percent of Fort Wayne's catch basins. The remaining 10 percent are an inlet grate. Removing the sediment and debris from the catch basin structures on a scheduled basis helps control floatables that might enter a waterway. Table 3 lists the amount of sediment and debris removed annually since 1998.

**TABLE 3**  
Catch Basin and Inlet Cleaning Program Annual Collection Summary

Year	Amount Collected (tons)
1998	1,567
1999	1,164
2000	1,828
2001	1,662
2002	1,450
2003	889
<b>Annual Average</b>	<b>1,427</b>

**FIGURE 1**  
Standard Catch Basin

Castings:  
24" Beehive Casting;  
24" Manhole Frame and Grate



Note:  
General Construction Requirements Same as Standard 48" Manhole  
Structure Base Alternatives Same as Standard 48" Manhole

## Recycling Program

During household garbage collection each home is given a recycling bin so recyclable items can be collected separately. In 1999 the City added the collection of cardboard and fiberboard and each household received two recycling bins to promote recycling. Table 4 presents the actual tons of recyclable material collected each year.

## Great America Clean Up Program (known as "Bag-A-Thon" prior to 2001)

Activities include neighborhood trash pickups and riverbank cleanups. The items collected have included discarded furniture, appliances, plastic bottles, Styrofoam, tires, and so on. Table 5 lists the volume of trash collected each year.

**TABLE 4**  
Recycling Program Annual Collection Summary

Year	Amount Collected (tons)
1997	7,300
1998	7,400
1999	7,400(+)
2000	9,462
2001	9,000
2002	8,973
2003	9,317
<b>Annual Average</b>	<b>8,407</b>

**TABLE 5**  
Great America Clean Up Program Annual Collection Summary

Year	Amount Collected (lb)	Amount Collected (tons)
1998	93,000	46.5
1999	306,000	153.0
2000	253,180	126.6
2001	108,320	54.2
2002	124,228 + 6,460 (from 3 additional river cleanups) = 130,688	65.3
2003	153,260	76.6
<b>Annual Average</b>	<b>174,075</b>	<b>87.0</b>

### Tox-Away Program

Tox-Away Day gives residents the opportunity to discard various toxic products in an environmentally safe way. This is held annually and consists of one full weekend at one given location. This is fully implemented but without data.

### Hazardous Spill Response Team

The hazardous spill response team responds to potential hazardous spills and performs the appropriate methods of cleanup. Every precaution is taken to contain the spill from entering a waterway. Most hazardous spill incidences relate to traffic accidents.

### Industrial Pretreatment Program

Significant industrial users, contract customers and non-major dischargers are monitored from strategic sampling points four times per year. This helps ensure that industrial waste to restaurant grease is discharged into the combined collection system within acceptable levels.

## Combined Sewer Flushing

Combined sewer flushing is most applicable to flat sewers where pollutants accumulate and enough water can be surged to produce a significant “first flush” effect. The City of Fort Wayne flushes 500,000 feet of pipe annually.

## Trash Collection and Public Education

The City of Fort Wayne reported collection of 88,177 tons of garbage in 2003. Public efforts can reduce the amount of solids and floatables by reducing litter in the streets, properly disposing of leaves and other debris from yards before they are washed to the storm sewers, and paying attention to the types of material that are disposed of in toilets. Each of these areas can be affected to varying degrees by public education and change of behavior.

## 2.2 Structural Solids and Floatables Control Technologies

Structural CSO solids and floatables control technologies provide physical separation of solids and floatables in the overflow stream before discharge to the receiving water. Due to aesthetic issues along the riverfront, end-of-pipe technologies such as booms and end-of-pipe netting facilities are not being considered. Baffles may be considered with some of the technologies below, but they are not very effective alone. Technologies include the following:

- Baffles
- Booms
- In-line Nets
- Screens (microscreens, mechanical screens, and coarse screens)
- Vortex separation
- Plain sedimentation (primary treatment)
- Flocculation and sedimentation
- High-rate filtration

Table 6 summarizes the attributes of these technologies .

## 2.3 Design Criteria

The 1992 Rainfall Frequency Atlas of the Midwest by Floyd A. Huff and James R. Angel identifies Fort Wayne in climatic section 3 in Figure 1 which corresponds to a rainfall of 0.56 inch for the 2-month, 1-hour storm in Table 2 (see Appendix A). Estimated Single-Event Overflow Volume graphs were provided by the City of Fort Wayne for each of the four CSO sites and included in Appendix B. Using these graphs, the rainfall depth of 0.56 inch was plotted on the 1-hour curves to determine an overflow volume in million gallons. The results are tabulated in Table 7. CSO peak rates assume the overflow volume duration is 1 hour. This short duration was selected as a conservative approach to equipment design.

**TABLE 6**  
Advantages and Disadvantages of Structural Solids and Floatables Controls

Technology	Advantages	Disadvantages and Limitations	Applicability
Baffles	<p>Inexpensive</p> <p>High floatables capture</p> <p>Low equipment maintenance</p> <p>Relatively small land requirements</p>	<p>Low solids capture</p> <p>Can be unreliable in effectiveness</p>	<p>Applicable to all Fort Wayne sites; consider further in combination with other technologies</p>
Booms	<p>Inexpensive and cost-effective</p> <p>High floatables capture</p> <p>Moderate implementation period</p> <p>No land requirements</p>	<p>Low solids capture</p> <p>Needs to be cleaned after each overflow event</p> <p>Potential for odors and an aesthetic nuisance if near high-use waterfront areas</p> <p>Potential high capital and maintenance costs for skimmer boats</p>	<p>Not applicable to Fort Wayne CSOs due to proximity of the rivers to high-use public areas; do not consider further</p>
In-line Nets	<p>Inexpensive and cost effective</p> <p>High capture of floatables</p> <p>Relatively inexpensive</p> <p>Moderate implementation period</p> <p>Relatively small land requirements</p>	<p>Moderate capture of solids</p> <p>Nets need to be replaced approximately 18 times per year</p> <p>Net replacement can potentially produce odors and be an aesthetic nuisance</p> <p>Potential high maintenance costs for nets</p>	<p>Although the maintenance duration is relatively short, maintenance may be an aesthetic issue at Fort Wayne sites; consider further</p>
Bar Screens	<p>Moderate capture of floatables</p> <p>Uses conventional technology</p> <p>Relatively small land requirements</p>	<p>Limited capture of solids</p> <p>Needs to be cleaned after each overflow event</p> <p>Potential for odors</p>	<p>Applicable to all Fort Wayne sites; consider further</p>
Microscreens	<p>High floatables and solids capture</p> <p>Uses conventional technology</p> <p>Relatively small land requirements</p>	<p>Need to be cleaned after each overflow event</p> <p>Potential for odors and clogging</p>	<p>Applicable to all Fort Wayne sites; consider further</p>
Vortex separator	<p>Moderate solids capture</p> <p>No moving parts</p> <p>Accepts a wide range of flow rates</p> <p>Relatively small land requirements</p> <p>Good cost-effectiveness for TSS removal</p>	<p>Limited floatables capture</p> <p>Influent pumping may be required</p> <p>Solids handling may be required</p> <p>Limited technology success</p>	<p>Applicable to all Fort Wayne sites; consider further</p>

**TABLE 6**  
Advantages and Disadvantages of Structural Solids and Floatables Controls

Technology	Advantages	Disadvantages and Limitations	Applicability
Plain sedimentation (primary treatment)	High capture of solids and floatables Proven, well-understood technology Sedimentation basins will provide some storage	Large land area requirements High cost; moderate cost-effectiveness	One Fort Wayne site (CSO #021) has sufficient space and greater need for more significant pollutant removal; consider further r
Flocculation/sedimentation	High capture of solids and floatables Proven, well-understood technology Sedimentation basins will provide some storage	Large land area requirements High cost; moderate cost-effectiveness Additional O&M requirements (chemical handling) Additional sludge handling	One Fort Wayne site (CSO #021) has sufficient space and greater need for more significant pollutant removal; however, chemical handling may not be desired at a remote location
High-rate filtration	High capture of floatables and moderate capture of solids Moderate land requirements (about the same as microscreens)	High O&M requirements High cost Limited CSO control experience	Applicable to all Fort Wayne sites; however, not worth the cost in comparison to other more cost-effective technologies

**TABLE 7**  
Calculations for Solids and Floatables Control for Four Selected Sites

CSO #	Geographic Location	Location #	Discharge Size	Tide Gate	Design Rainfall Criteria:			CSO Peak Rate (cfs)	CSO Annual Volume (ft³)	CSO Annual Frequency	Annual (LTCP CSO Volume (ft³)	LTCP Annual Frequency	S/F Control
					2-month, 1-hour Storm (in./hr)	CSO Volume (MG)	CSO Volume (ft³)						
017	Waldron Circle/ Wildwood	K07-176	42"	flap	0.56	0.5	963,279	19	848,473	32	848,473	13	Small footprint screen
021	Avenue/Foster Park Fairfax	K19-044	66"	flap	0.56	0.59	1,425,564	22	270,000	56	270,000	10	85% TSS & Particulate BOD; >90% Turbidity removal; 85% P removal
026*	Third Street Pump Station	M10-151	72" & 84"	flap	0.56	1.95	8,781,182	72	1,150,000	66	1,150,000	13	screen; reconstruct outfall
027	Third Street Pump Station	M10-202	72"	flap	sluice gate always closed; does not overflow			0	0	0	0	0	none needed
033*	Third Street Pump Station	M10-313	4 @ 42" each	flap	2" spacing on bar screens in pump station; therefore, no additional control needed			8,781,182	1,150,000	66	1,150,000	13	2" bar screen already in place
052	Concordia High School Access Road	O22-004	48"	flap	0.56	0.21	782,402	8	0	45	0	0	Screen that can also be used for stormwater long term
Information Source: Fort Wayne Basin Reports    Site Visits and Fort Wayne Sewer Utility Maps    Site Visits    per Pat Callahan and Rainfall Frequency Atlas of the Midwest (1992)    Estimated Single Event Overflow Volume Charts from Fort Wayne    Calculated    Long-Term Water Quality Control Plan excerpts by Pat Callahan    Long-Term Water Quality Control Plan excerpts by Pat Callahan    Long-Term Water Quality Control Plan excerpts by Pat Callahan													

\* Flows are divided between CSO 026 and CSO 033.

## 2.4 Vendor Overview

A variety of vendors were contacted and provided with the calculated peak flow rates presented in Table 7. Table 8 summarizes the vendors contacted regarding specific technologies. Additional information regarding these technologies is provided in Appendix C.

**TABLE 8**  
Summary of Vendor Technologies

Vendor	Technology	Removal Effectiveness
CDS Alternative 1 (Appendix C-1)	4-mm raked bar screen	Removes trash and debris greater than 4 mm
CDS Alternative 2 (Appendix C-1)	1-mm gross solids screening	Removes all particles to 200 microns
CDS Alternative 3 (Appendix C-3)	Chemical flocculation with 1mm gross solids screening	Removes all particles to 200 microns and essentially all suspended solids and 90% phosphorus removal
Krüger (Appendix C-2)	Physical-chemical ACTIFLO high rate treatment process	4 mm pre-screening followed by 90% removal of suspended solids
Grande (Appendix C-3)	ACU-screen with 3/16" openings automatically cleaned by brush to return debris to sewer; may require ACU-bend (bending weir) to ensure sufficient head	Removes trash and debris greater than 3/16"
Fresh Creek (Appendix C-4)	Net system with 1/2" mesh	Removes trash and debris greater than 1/2"
Parkson (Appendix C-5)	ROMAG bar screen with 4-mm spacing automatically cleaned by combs to return debris to sewer	Removes large trash and debris greater than 4 mm
Hydro International <sup>a</sup>	Various screens with 4- to 6-mm spacing	Removes trash and debris greater than 4 mm

Note:

Technology descriptions and removal effectiveness information is per vendor information.

<sup>a</sup>Requested but did not receive Fort Wayne-specific information from Hydro International.

Vendors provided equipment costs. Order-of-magnitude construction costs were developed by CH2M HILL and are summarized in Table 9. Operation and maintenance cost information supplied by vendors was inconsistent and subjective as to frequency of inspection, repair, and replacement; therefore, the order-of-magnitude operation and maintenance costs provided in Table 9 is preliminary at this time. Backup documentation on cost estimate development is provided in Appendix D. Table 9 also lists the preferred structural alternatives.

**TABLE 9**  
Cost Estimate Summary of Technologies at Each Site

# CH2MHILL

Estimator: Wm. Griffith / MKE  
Project Mgr: Webster, Todd/MKE  
Project #: 316657  
Estimate #: Conceptual / Alternatives  
Rev. #: # 4  
Est. Date: 11/29/2004

## Order-of-Magnitude Estimate

Combined	Engineer's Estimate	\$566,000.00
		\$849,000 High Value +50 %
		\$396,200 Low Value - 30%

Facility			Alternate Vendor CDS	Equipment Footprint	Alternate Vendor KRUGER <sup>1</sup>	Alternate Vendor GRANDE	Alternate Vendor Fresh Creek Tech	Alternate Vendor Parkson Corp	Comments	Preferred Structural Alternative	
Site # 17	Alt #1	Waldron	\$81,000	3.5' x 4.33'	\$1,797,223	\$125,000	\$176,049	\$217,922	select smallest unit	\$81,000	
Site # 17	Alt #2	Circle/	\$273,000	10' x 15'							
Site # 17	Alt #3	Wildwood	\$776,000	22' x 45'	43.2' x 15.1'	8.5' x 10'	4' x 16'	12.6'			
Site # 21	Alt #1	Fairfax Avenue/	\$85,000	4.25' x 4.33'	\$1,878,122	\$131,000	\$224,497	\$231,060	select highest quality screening alternative	\$273,000	
Site # 21	Alt #2	Foster	\$273,000	10' x 15'							
Site # 21	Alt #3	Park	\$813,000	30' x 50'	44.9' x 16.1'	8' x 8'	7.5' x 17'	12.6'			
Site # 26	Alt #1	Third Street	\$131,000	3.5' x 17.33'	\$4,230,509	\$197,624	\$395,775	\$337,366	select smallest unit	\$131,000	
Site # 26	Alt #2	Pump Station	\$739,000	30' x 18'							
Site # 26	Alt #3		\$1,743,000	61' x 70'	52.8' x 20.9'	20' x 10'	13.33' x 19.33	25.7'			
Site # 52	Alt #1	Concordia High School	\$77,000	2' x 4.33'	\$1,423,040	\$118,918	\$182,175	\$180,442	select smallest unit	\$77,000	
Site # 52	Alt #2		\$235,000	10' x 12'							
Site # 52	Alt #3	Access	\$560,324	21' x 35'	31.9' x 10.7'	6' x 8'	4' x 16'	12.6'			
Subtotal - Base Capital Construction Costs											\$562,000
Operations & Maintenance Costs											
		CDS - Raked Bar	CDS - GSS	CDS - FSS	Alternate Vendor KRUGER1	Alternate Vendor GRANDE	Alternate Vendor Fresh Creek Tech	Alternate Vendor Parkson Corp			
Frequency		Annual Based on trips	Annual Based on trips	Annual Based on trips	Est 3 days Based per Day Quote		One trip replacement / 3 maint	4 annual Trips, elec, inspect, replace fluids			
Site # 17		\$372	\$2,630	\$4,419	\$5,083 annual	\$2,086	\$4,961	\$335		\$372	
Site # 21		\$372	\$2,630	\$4,419	\$5,899 annual	\$2,086	\$4,961	\$335		\$2,630	
Site # 26		\$372	\$2,630	\$4,419	\$20,140 annual	\$2,086	\$4,961	\$335		\$372	
Site # 52		\$372	\$2,630	\$4,419	\$2,127 annual	\$2,086	\$4,961	\$335		\$372	
Subtotal - Operations & Maintenance Costs											\$3,746

**Total CCC & O-M** **\$566,000**  
Rounded (3)

<sup>1</sup> Kruger's ACTIFLO process will likely require additional pre-screening best determined by site-specific analysis; therefore, it is likely that the construction price will increase to include some amount of pre-screening should this alternative move forward in selection.

## Order-of-Magnitude Estimate

An order-of-magnitude estimate is made without detailed engineering data. Some examples include:

- > An estimate from cost capacity curves
- > An estimate using scale-up or scale-down factors
- > An approximate ratio estimate, base on technologies

Typically, an order-of-magnitude estimate is prepared at the end of the schematic design phase of the design delivery process. It is normally expected that an estimate of this type would be accurate within plus 50 percent to minus 30 percent of the estimated cost. The cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project costs, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.

## 2.5 Indiana Department of Environmental Management Setback Requirement

Indiana has a 500-foot setback requirement relating to construction of wastewater treatment facilities (327 IAC 3-2-6; where IAC is Indiana Administrative Code). The requirement and a August, 13, 2004, draft interpretation of the requirement prepared by IDEM's Wet Weather Section on how the requirement applies to combined sewer overflow projects is provided in Appendix E. 327 IAC 3-2-6b states that the separation distances may be shortened if the affected dwelling owners agree to a shortened separation. The 500-foot setback requirement precludes the selection of structural controls at CSO 017 (Waldron Circle/Wildwood Avenue), CSO 021 (Fairfax Avenue/Foster Park), and CSO 026 (Third Street Pump Station) unless the affected dwelling owners agree to a shortened distance. CSO 017 is adjacent to dwellings; CSO 021 is physically separated from dwellings by a fence and separate access road; and CSO 026 already has many wastewater control structures in place. Construction permits are granted through IDEM's Facilities Construction & Engineering Support Section.

## 2.6 Proposed Long Term CSO Controls

The ongoing progress of Fort Wayne's other CSO-related programs (long-term control plan development, monitoring, stream characterization, operational plan update) is connected to solids and floatables decisionmaking. The current draft of the long-term plan indicates the following:

**TABLE 10**  
Fort Wayne's Draft CSO Long-Term Control Plan for the Four Selected Sites

Site	Draft CSO Long-Term Control Plan
CSO 017: Waldron Circle/ Wildwood	Proposed tunnel system
CSO 021: Fairfax/Foster Park	Proposed tunnel system
CSO 026: Third Street Pump Station	Proposed tunnel system
CSO 056: Concordia High School Access Road	Proposed sewer separation

## 2.7 Proposed Short-Term Solids and Floatables Control

Given the effectiveness of the current non-structural programs, Indiana's 500-foot setback requirement for construction, and the long-term CSO control plans and implementation schedule, short-term solids and floatables controls are proposed in Table 11 for the following reasons:

**TABLE 11**  
Comments on Proposed Short-Term Controls

Site	Proposed Short-Term Control	Comments
CSO 017 Waldron Circle/ Wildwood	Non-structural programs	Small, constrained site, in close proximity to residences
CSO 021 Fairfax/Foster Park	Non-structural programs and best piloting option for short-term structural control	End of proposed tunnel system; ample construction space and access; separated from residences; most visible solids and floatables issues; adjacent to well-used parkland; easiest location to incorporate a structural short-term control with a structural long-term control <sup>a</sup>
CSO 026 Third Street Pump Station	Non-structural programs	Congested, visible site in close proximity to residences; existing regulator needs complete rebuild which should be incorporated with long-term plan plans
CSO 056 Concordia High School Access Road	Non-structural programs	Reasonable construction space and access; however, long-term control may include sewer separation rendering a structural control at this site potentially obsolete

<sup>a</sup>CSO 021 structure is within the 500-foot Indiana set-back requirement for construction and would require agreement to a shortened distance by the affected dwelling owners.

### **3. Conclusions and Recommendations**



## 3. Conclusions and Recommendations

There are several conclusions and recommendations as a result of this study. The order of the conclusions and recommendations do not necessarily reflect their degree of importance.

### 3.1 Conclusions

1. Out of 44 CSO locations reviewed for solids and floatables nuisances, only 6 sites were recommended for further investigation at this time (CH2M HILL. July 23, 2004. *City of Fort Wayne Recommended CSO Sites for Further Solids and Floatables Investigation*).
2. Of the 6 CSO sites recommended for further solids and floatables investigation at this time, 3 CSO sites are adjacent to each other at the Third Street Pump Station.
3. Of the 3 CSO sites adjacent to each another at the Third Street Pump Station, CSO 027 has a sluice gate maintained in the closed position, resulting in a zero discharge; and CSO 033 includes a 2-inch bar rack, resulting in a screened discharge.
4. Indiana's 500-foot setback requirement for construction of wastewater treatment facilities impacts 3 of the 4 remaining selected sites (CSO 017 Waldron Circle/ Wildwood Avenue, CSO 021 Fairfax Avenue/Foster Park, and CSO 026 Third Street Pump Station) unless the affected dwelling owners agree to a shortened distance.
5. Several effective non-structural solids and floatables control programs are currently in place throughout the City.
6. The ongoing progress of Fort Wayne's other CSO-related programs (long-term control plan development, monitoring, stream characterization, operational plan update) is connected to solids and floatables decisionmaking.
7. Given the effectiveness of the current non-structural programs, the long-term CSO control plans and implementation schedule, and Indiana's 500-foot setback requirement for construction, the solids and floatable controls listed in Table 12 are recommended.

**TABLE 12**  
Proposed Solids and Floatables Control for the Four Selected Sites

CSO	Proposed Solids and Floatables Control
CSO 017 Waldron Circle/ Wildwood	Non-structural programs
CSO 021 Fairfax/Foster Park	Non-structural programs and best piloting option for short-term structural control
CSO 026 Third Street Pump Station	Non-structural programs
CSO 056 Concordia High School Access Road	Non-structural programs

## 3.2 Recommendations

1. Continue documentation of the non-structural programs currently in place. Consider developing a cost-benefit estimate for each of the programs and recording implementation of the programs by sewer system tributary area. Developing cost-benefit estimates can be achieved by accurate tracking of costs of the program versus quantities and volumes of materials collected. Documentation by sewer system tributary area can be achieved by working closely with the City's geographic information system (GIS) staff.
2. Begin discussions with neighborhood groups in the affected residential areas regarding the possibility of them agreeing to shortened setback distances. Discuss precedence of granting construction permits in similar situations with IDEM's Facilities Construction & Engineering Support Section.
3. Consider only non-structural solids and floatables controls at this time for CSO 017, 026, an 056, and consider integrating structural controls with the long-term controls (that is, include structural solids and floatables control as part of the long-term plan).
4. Consider piloting a structural solids and floatables control at CSO 021 (Fairfax/Foster Park) for the following reasons: (1) it is an upstream site which will have less interference with a long term control; (2) there has been evidence of finer solids discharged at this CSO location; and (3) there is adequate construction space with some physical separation from the public. To pursue this action, the next steps include:
  - Revisiting the 2-month, 1-hour design criteria in concert with the design criteria for the long-term control plan solution at each specific site
  - Refining the design and costs with the preferred vendor
  - Obtaining approval of a shorter set-back requirement from the affected residences
  - Confirming regulatory agency approval prior to any construction

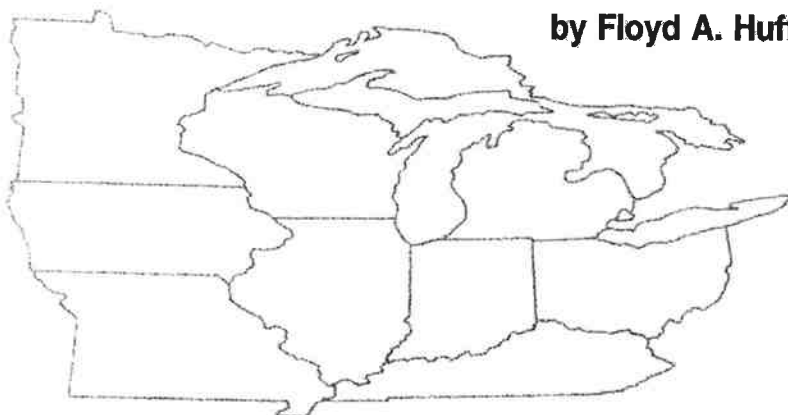
**Appendix A**  
**Excerpt from *Rainfall Frequency***  
***Atlas of the Midwest (1992)***

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# **RAINFALL FREQUENCY ATLAS OF THE MIDWEST**

**by Floyd A. Huff and James R. Angel**



Midwestern Climate Center  
Climate Analysis Center  
National Weather Service  
National Oceanic and Atmospheric Administration

and

Illinois State Water Survey  
A Division of the Illinois Department of Energy and Natural Resources

1992



(MCC) with Stanley Changnon and Peter J. Lamb as the co-principal investigators. The work was continued and completed under the general direction of Kenneth Kunkel, present MCC Director.

Special appreciation goes to Stan Changnon for his foresight, guidance, and encouragement in establishing and accomplishing the program objectives. He and Ken Kunkel reviewed the report and made useful comments and suggestions. Special thanks go to Richard Katz, National Center for Atmospheric Research; Tibor Farago, Hungarian Meteorological Service; and J.R.M. Hosking, IBM Research Division, for providing software for some of the extreme rainfall

analyses. Fred Nurnberger, Michigan State Climatologist, provided valuable long-term precipitation data for his state as well as comments on the manuscript. We also thank the following state climatologists for their review and comments on this project: Wayne Wendland, Illinois; Ken Scheeringa, Indiana; Harry Hillaker, Iowa; Glen Conner, Kentucky; Jim Zandlo, Minnesota; Wayne Decker, Missouri; Jeff Rogers, Ohio; and Pam Naber-Knox, Wisconsin.

John Brother and Linda Hascall supervised the extensive drafting work required for the report. Jean Dennison typed and assembled the report, which Eva Kingston edited and formatted.

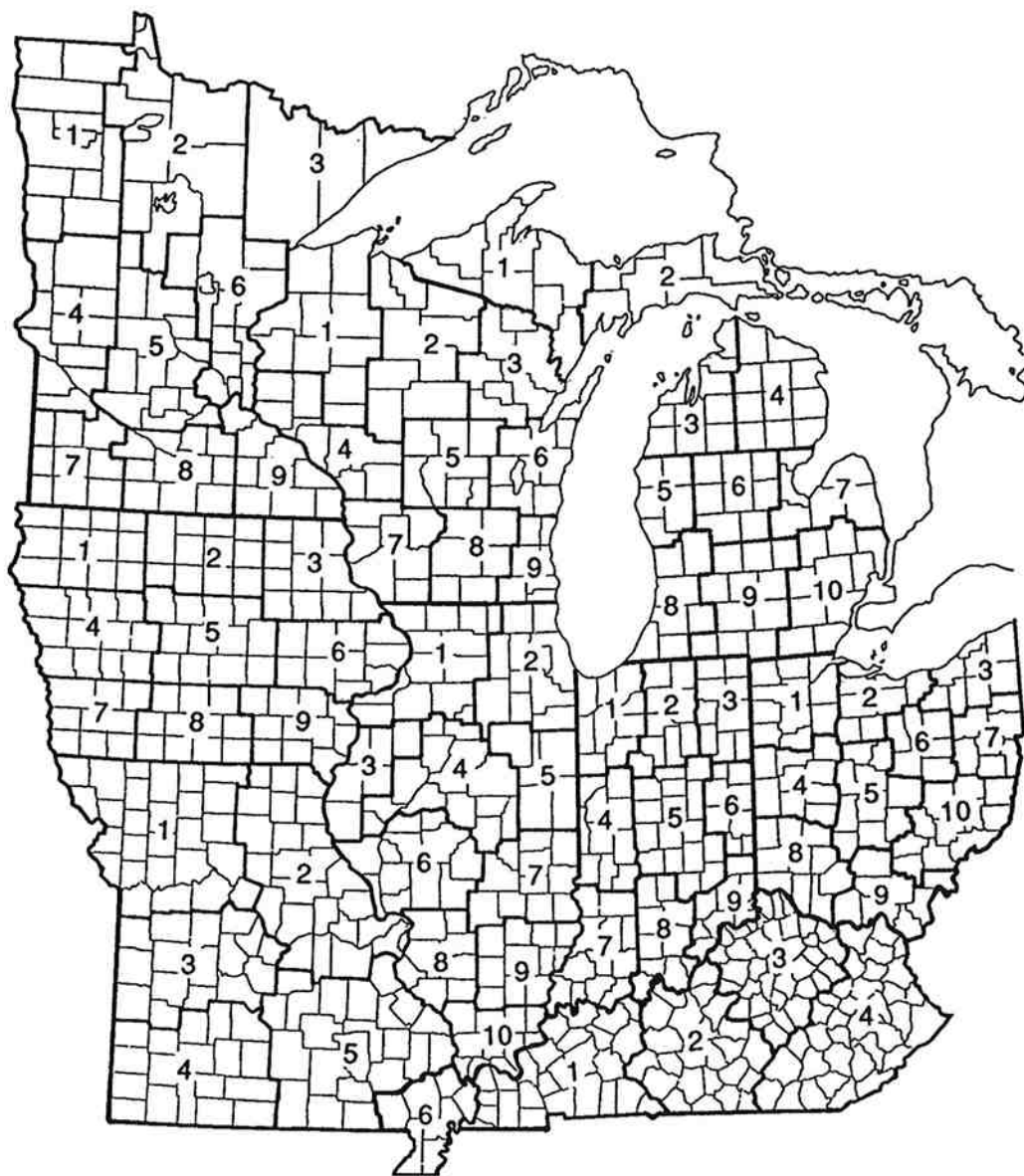


Figure 1. Climatic sections for the Midwest

**Table 2. Sectional Mean Frequency Distributions for Storm Periods of 5 Minutes to 10 Days and Recurrence Intervals of 2 Months to 100 Years in Indiana**

*Sectional code (see figure 1 on page 4)*

01- Northwes      06 - East Central  
 02 - North Central      07 - Southwest  
 03 - Northeast      08 - South Central  
 04 - West Central      09- Southeast  
 05 - Central

*Rainfall (inches) for given recurrence interval*

Section	Duration	2-month	3-month	4-month	6-month	9-month	1-year	2-year	5-year	10-year	25-year	50-year	100-year
01	10-day	2.07	2.50	2.88	3.38	3.89	4.23	4.84	5.79	6.67	8.03	9.23	10.58
01	5-day	1.68	2.01	2.27	2.63	3.03	3.29	3.84	4.70	5.50	6.81	7.99	9.37
01	72-hr	1.53	1.80	2.04	2.36	2.71	2.95	3.46	4.24	4.97	6.10	7.17	8.38
01	48-hr	1.40	1.64	1.83	2.12	2.44	2.65	3.12	3.87	4.56	5.58	6.52	7.58
01	24-hr	1.33	1.55	1.69	1.96	2.23	2.42	2.89	3.61	4.22	5.22	6.10	7.12
01	18-hr	1.25	1.45	1.59	1.84	2.09	2.27	2.72	3.39	3.97	4.91	5.73	6.69
01	12-hr	1.16	1.35	1.48	1.71	1.94	2.11	2.51	3.14	3.67	4.54	5.31	6.19
01	6-hr	1.00	1.16	1.27	1.47	1.67	1.82	2.17	2.71	3.16	3.91	4.57	5.34
01	3-hr	0.85	0.99	1.08	1.26	1.43	1.55	1.85	2.31	2.70	3.34	3.90	4.56
01	2-hr	0.77	0.90	0.98	1.13	1.29	1.40	1.68	2.09	2.45	3.03	3.54	4.13
01	1-hr	0.63	0.73	0.80	0.92	1.05	1.14	1.36	1.70	1.98	2.45	2.87	3.35
01	30-min	0.50	0.58	0.63	0.73	0.83	0.90	1.07	1.34	1.56	1.93	2.26	2.63
01	15-min	0.36	0.42	0.45	0.53	0.60	0.65	0.78	0.97	1.14	1.41	1.65	1.92
01	10-min	0.28	0.33	0.36	0.41	0.47	0.51	0.61	0.76	0.89	1.10	1.28	1.50
01	5-min	0.16	0.19	0.20	0.23	0.27	0.29	0.35	0.43	0.51	0.63	0.73	0.85
02	10-day	2.04	2.45	2.83	3.33	3.83	4.16	4.75	5.64	6.45	7.69	8.80	10.03
02	5-day	1.68	2.01	2.28	2.64	3.04	3.30	3.80	4.62	5.38	6.57	7.63	8.85
02	72-hr	1.48	1.74	1.97	2.28	2.62	2.85	3.33	4.10	4.79	5.88	6.86	8.00
02	48-hr	1.37	1.60	1.78	2.06	2.37	2.58	3.02	3.73	4.36	5.36	6.25	7.28
02	24-hr	1.30	1.51	1.65	1.91	2.17	2.36	2.78	3.43	4.00	4.90	5.67	6.54
02	18-hr	1.22	1.42	1.55	1.80	2.04	2.22	2.61	3.22	3.76	4.61	5.33	6.15
02	12-hr	1.13	1.31	1.43	1.66	1.89	2.05	2.42	2.98	3.48	4.26	4.93	5.69
02	6-hr	0.97	1.13	1.24	1.43	1.63	1.77	2.09	2.57	3.00	3.68	4.25	4.90
02	3-hr	0.83	0.97	1.06	1.22	1.39	1.51	1.78	2.20	2.56	3.14	3.63	4.19
02	2-hr	0.75	0.88	0.96	1.11	1.26	1.37	1.61	1.99	2.32	2.84	3.29	3.79
02	1-hr	0.61	0.71	0.78	0.90	1.02	1.11	1.31	1.61	1.88	2.30	2.66	3.07
02	30-min	0.48	0.56	0.61	0.70	0.80	0.87	1.03	1.27	1.48	1.81	2.10	2.42
02	15-min	0.35	0.41	0.45	0.52	0.59	0.64	0.75	0.93	1.08	1.32	1.53	1.77
02	10-min	0.28	0.32	0.35	0.41	0.46	0.50	0.58	0.72	0.84	1.03	1.19	1.37
02	5-min	0.15	0.18	0.20	0.23	0.26	0.28	0.33	0.41	0.48	0.59	0.68	0.78
03	10-day	1.81	2.18	2.52	2.96	3.40	3.70	4.25	5.12	5.84	6.96	8.01	9.16
03	5-day	1.52	1.82	2.06	2.38	2.74	2.98	3.46	4.18	4.81	5.83	6.76	7.80
03	72-hr	1.35	1.59	1.79	2.08	2.39	2.60	3.01	3.68	4.27	5.21	6.06	7.01
03	48-hr	1.27	1.48	1.65	1.91	2.20	2.39	2.77	3.38	3.92	4.78	5.57	6.45
03	24-hr	1.19	1.38	1.51	1.75	1.99	2.16	2.52	3.04	3.52	4.29	5.02	5.77
03	18-hr	1.12	1.30	1.42	1.64	1.87	2.03	2.37	2.86	3.31	4.03	4.72	5.42
03	12-hr	1.03	1.20	1.32	1.52	1.73	1.68	2.19	2.64	3.06	3.73	4.37	5.02
03	6-hr	0.89	1.04	1.13	1.31	1.49	1.62	1.89	2.28	2.64	3.22	3.76	4.33
03	3-hr	0.76	0.88	0.97	1.12	1.27	1.38	1.61	1.95	2.25	2.75	3.21	3.69
03	2-hr	0.69	0.80	0.88	1.01	1.15	1.25	1.46	1.76	2.04	2.49	2.91	3.35
03	1-hr	0.56	0.65	0.71	0.83	0.94	1.02	1.18	1.43	1.65	2.02	2.36	2.71
03	30-min	0.44	0.51	0.56	0.65	0.74	0.80	0.93	1.12	1.30	1.59	1.86	2.13
03	15-min	0.32	0.37	0.41	0.47	0.53	0.58	0.68	0.82	0.95	1.16	1.36	1.56
03	10-min	0.25	0.29	0.31	0.36	0.41	0.45	0.53	0.64	0.74	0.90	1.05	1.21
03	5-min	0.14	0.17	0.18	0.21	0.24	0.26	0.30	0.36	0.42	0.51	0.60	0.69

**Appendix B**  
**Estimated Single-Event Overflow**  
**Volume Graphs**

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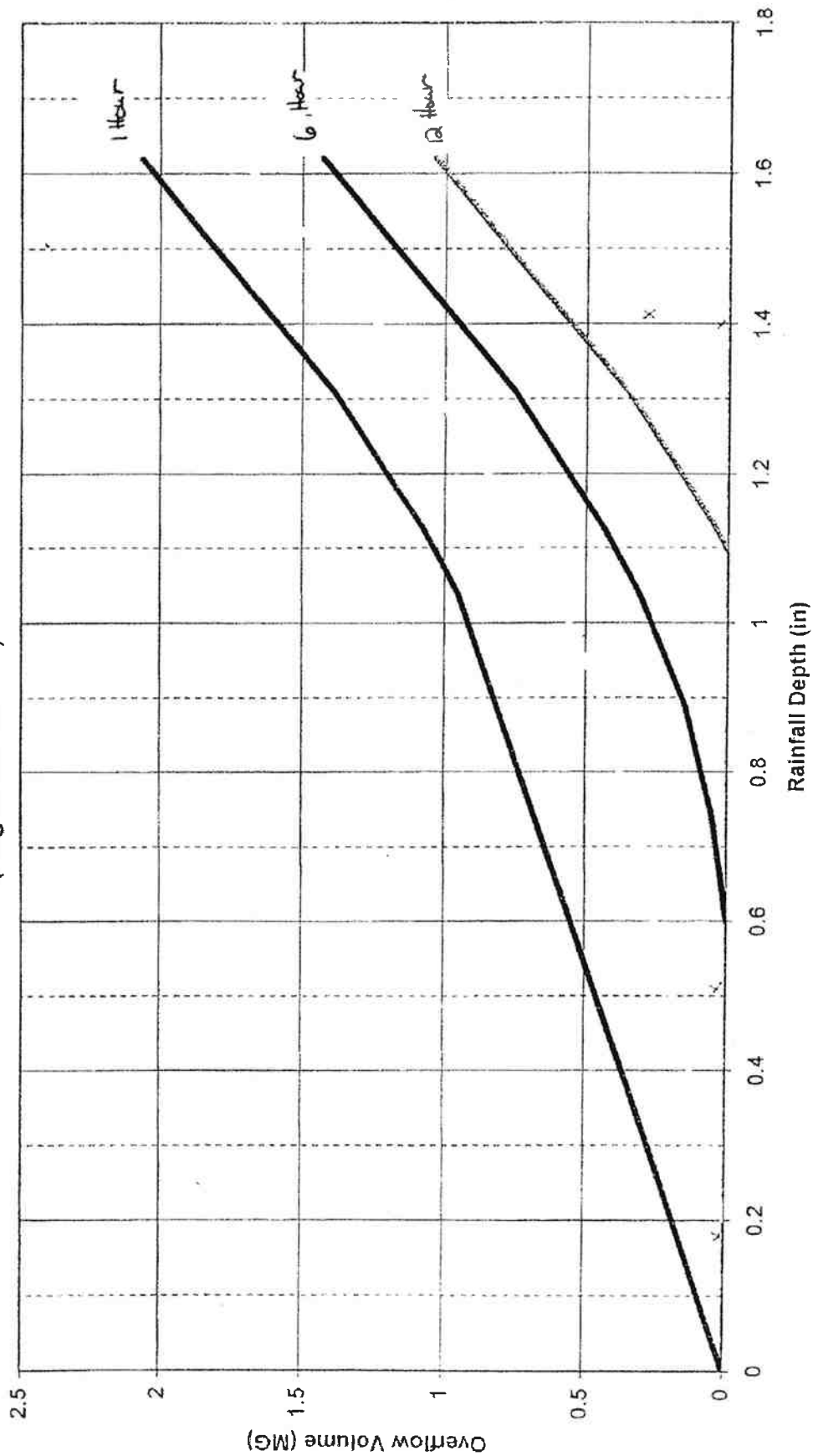


# **Discharge Point**

## **K07-176**



Estimated Single-Event Overflow Volumes  
 Discharge Point K07176  
 (Regulator K07171)



— 1-hour duration event    - - - 3-hour duration event    . . . 6-hour duration event    x x x 12-hour duration event

Estimated Single-Event Overflow Duration  
 Discharge Point K07176  
 (Regulator K07171)

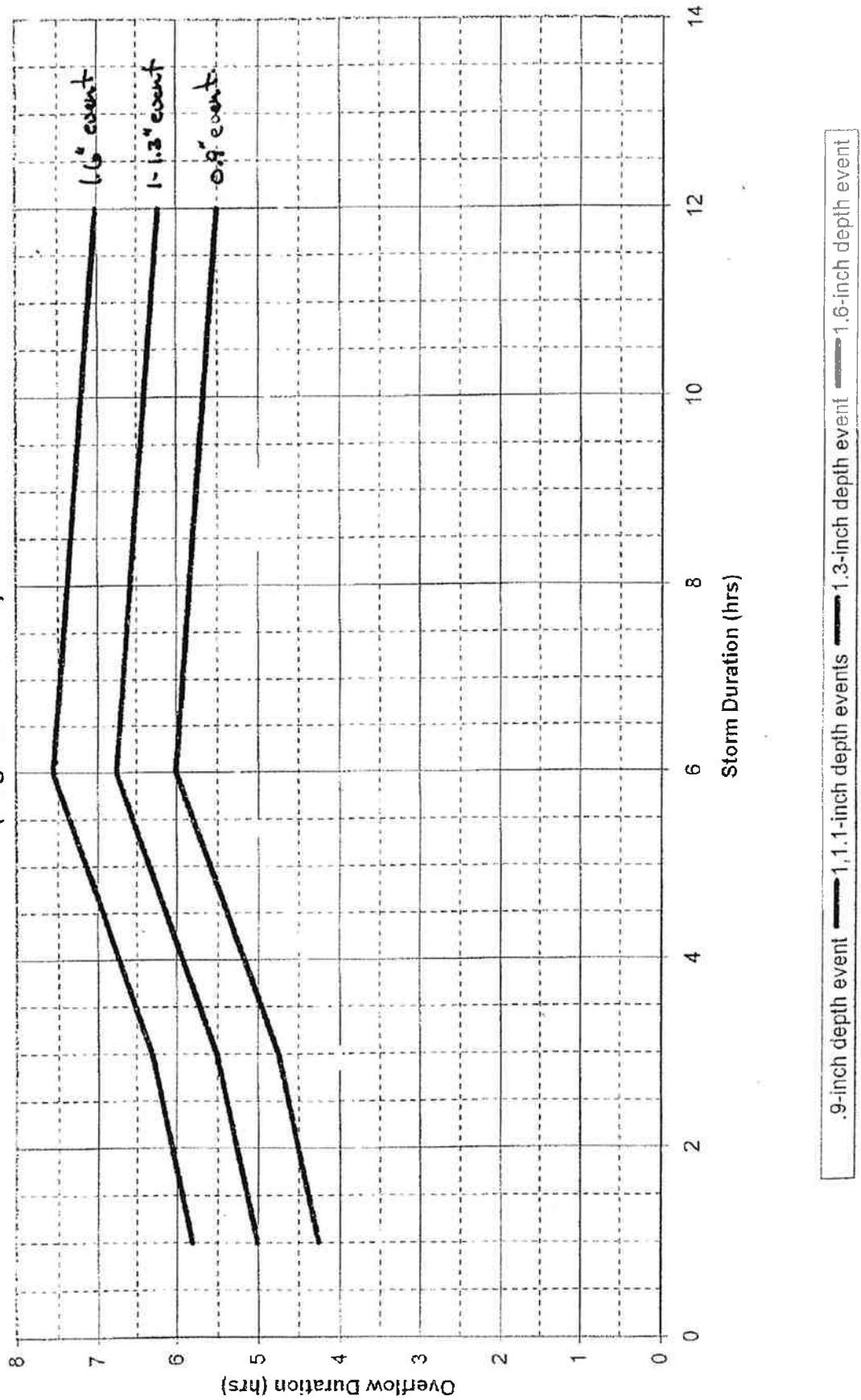
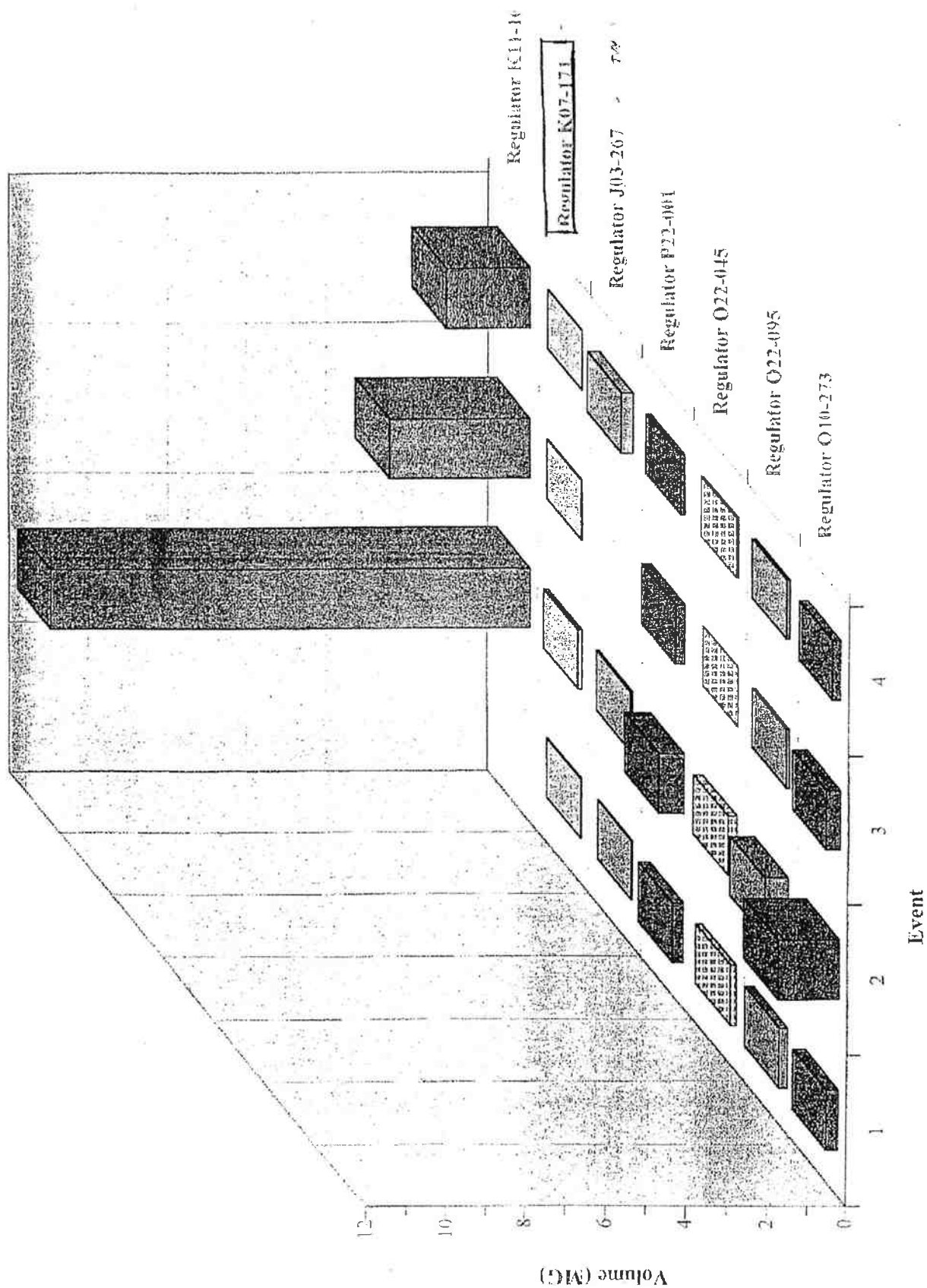


FIGURE 4-1  
CSO DISCHARGE VOLUMES



Note: Flow Meters did not work at Regulator K11-163 during Event 1 and Regulator J03-267 during Event 3.

LONG TERM WATER QUALITY PLAN

K07 171

CURRENT

ANNUAL OVERFLOW VOLUME 743,279 CF (18)

ANNUAL OVERFLOW EVENTS 32 EA (12)

PLANNED

ANNUAL OVERFLOW VOLUME 848,473 CF

ANNUAL OVERFLOW EVENTS 13 EA

K07 - 102 (K07 115)

CURRENT

ANNUAL OVERFLOW VOLUME 73,187 CF

ANNUAL OVERFLOW EVENTS 63 EA

PLANNED

ANNUAL OVERFLOW VOLUME 3,467 CF

ANNUAL OVERFLOW EVENTS 1 EA

K07-006

CURRENT

ANNUAL OVERFLOW VOLUME 6,621 CF

ANNUAL OVERFLOW EVENTS 9 EA

PLANNED

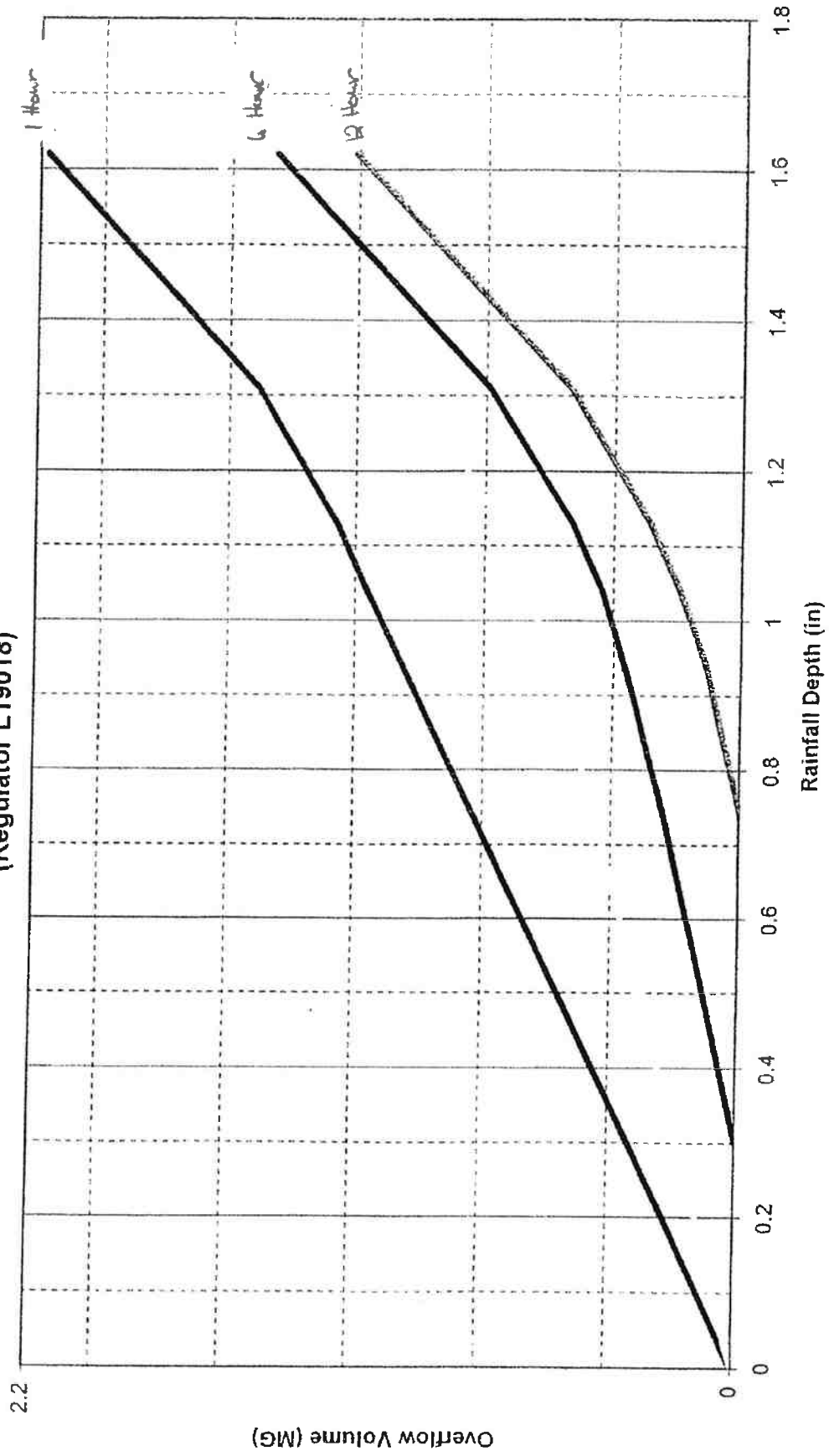
NO CHANGES PLANNED

# **Discharge Point**

## **K19-044**

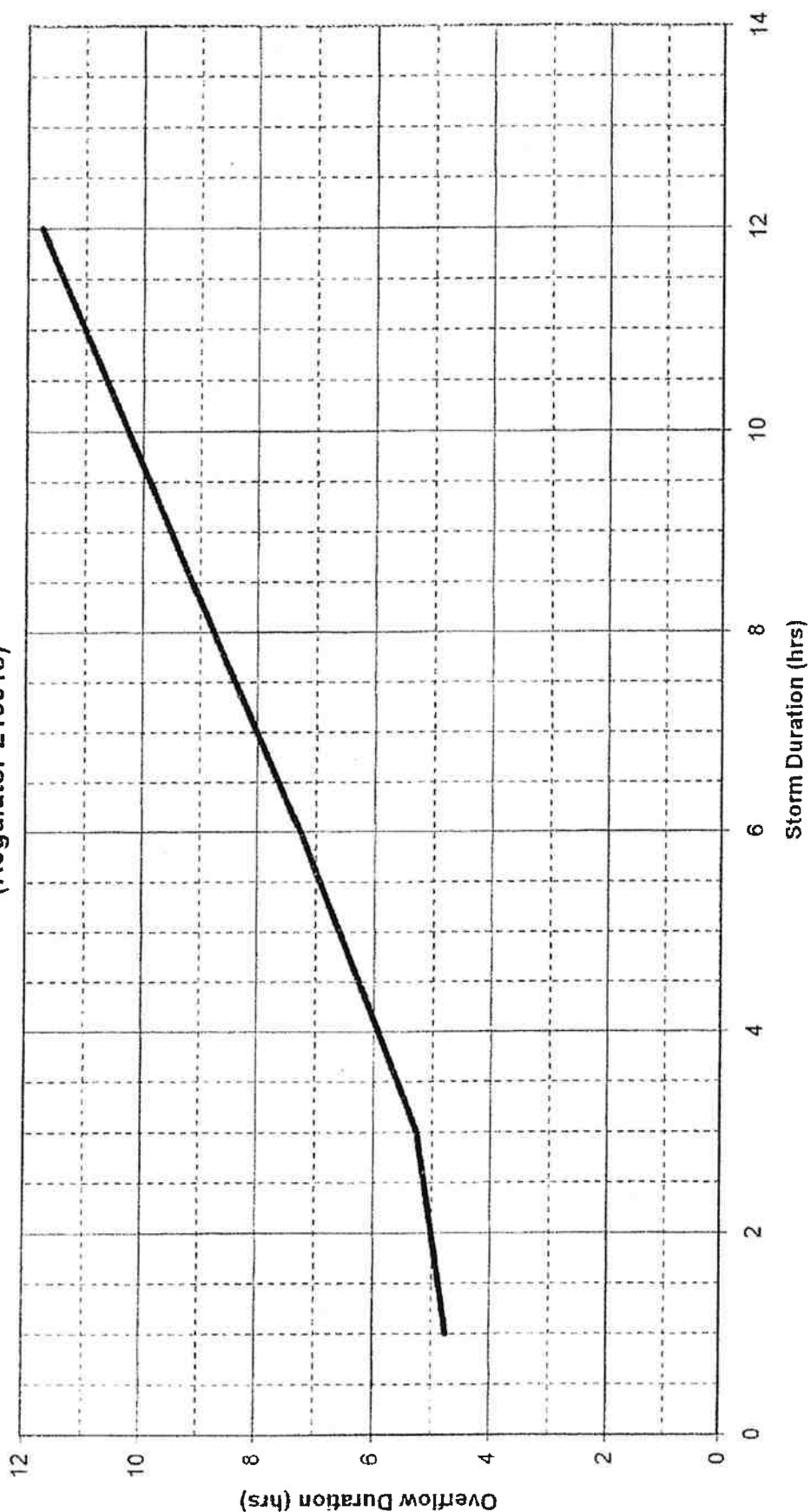


Estimated Single-Event Overflow Volumes  
 Discharge Point K19044  
 (Regulator L19018)



1-hour duration event    3-hour duration event    6-hour duration event    12-hour duration event

# Estimated Single-Event Overflow Duration Discharge Point K19044 (Regulator L19018)



— .9, 1, 1.1, 1.3, 1.6-inch depth events

## LONG TERM WATER QUALITY PLAN

### Current Events

Annual Overflow Volume      1,425,564 cf.

Annual Number of Overflows      56 ea.

### Planned Improvements

CSSCIP – Preliminary Engineering/Improvements

LTCP – Construct St. Marys parallel interceptor, transport cost effective volume of overflows to ponds for treatment.

### Planned Events

Annual Overflow Volume      270,000 cf.

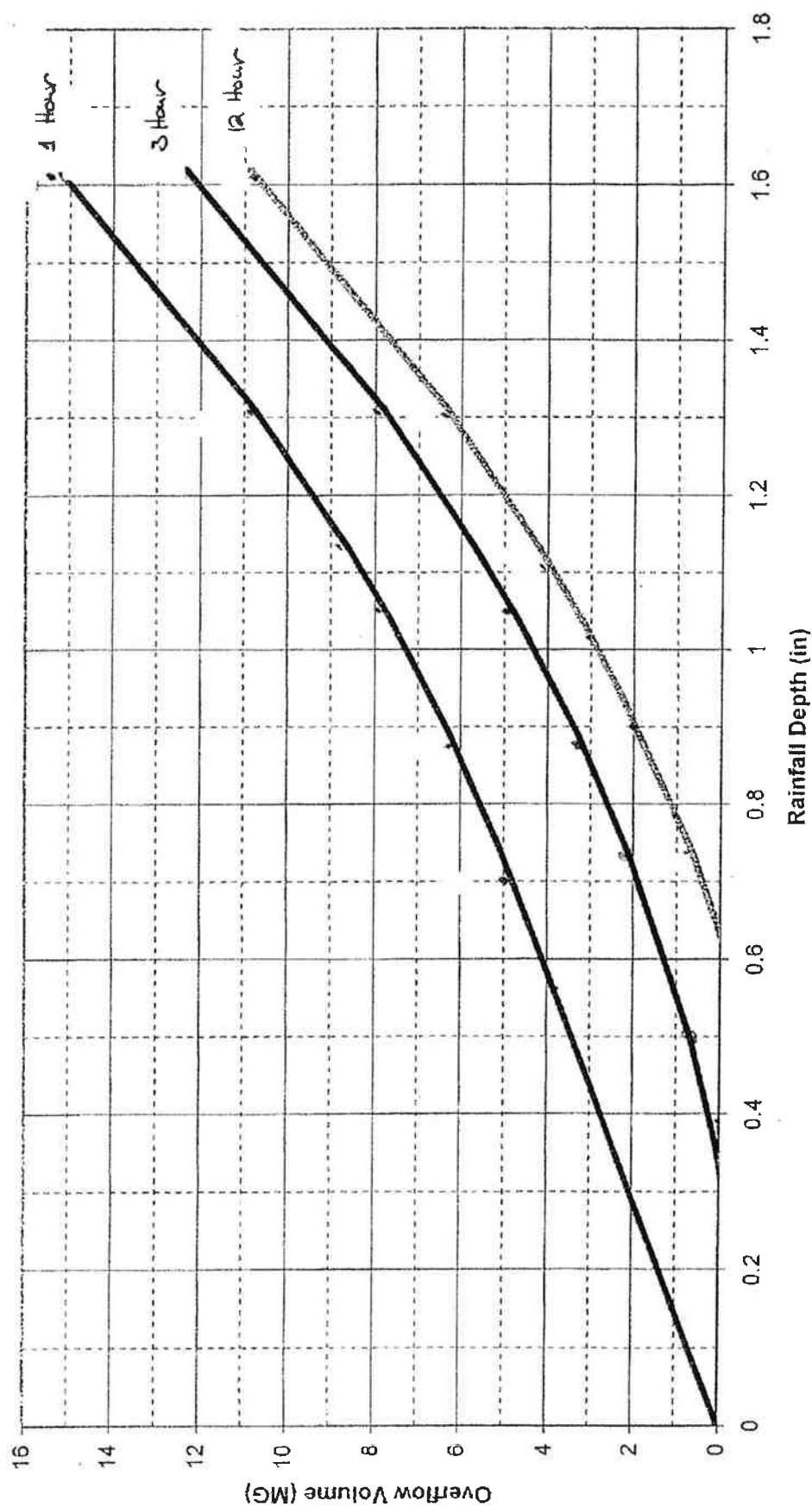
Annual Number of Overflows      10 ea.



**Discharge Point**  
**M10-151, M10-202, M10-303**

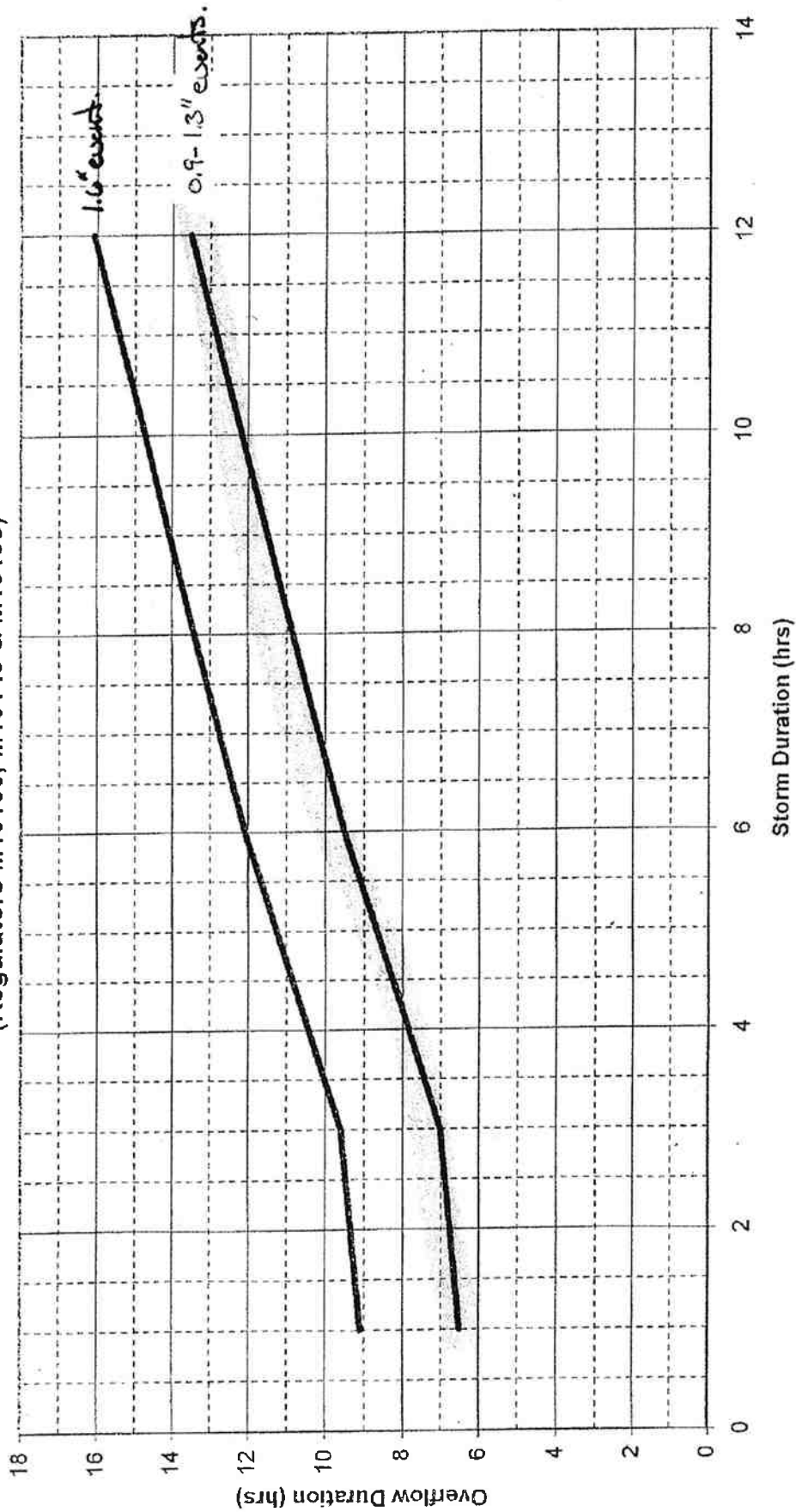


# Estimated Single-Event Overflow Volumes Discharge Points M10151, M10313 & M10202 (Regulators M10150, M10149 & M10199)



— 1-hour duration event    - - - 3-hour, 6-hour duration events    . . . 12-hour duration event

Estimated Single-Event Overflow Duration  
 Discharge Points M10151, M10313 & M10202 - TILDEN STREET  
 (Regulators M10150, M10149 & M10199)



— 0.9, 1.1, 1.3-inch depth events      - - - - - 1.6-inch depth event

## LONG TERM WATER QUALITY PLAN

### Current Events

Annual Overflow Volume      cf. 17,562,363

Annual Number of Overflows      ea. 66

### Planned Improvements

CSSCIP – Preliminary Engineering Reports, Planning, and Construction have been completed

LTCP – Construction of Wayne St. parallel interceptor: Capture 8 of top 15 regulators (those most visible downtown)

### Planned Events

Annual Overflow Volume      cf. 2,300,000

Annual Number of Overflows      ea. 13

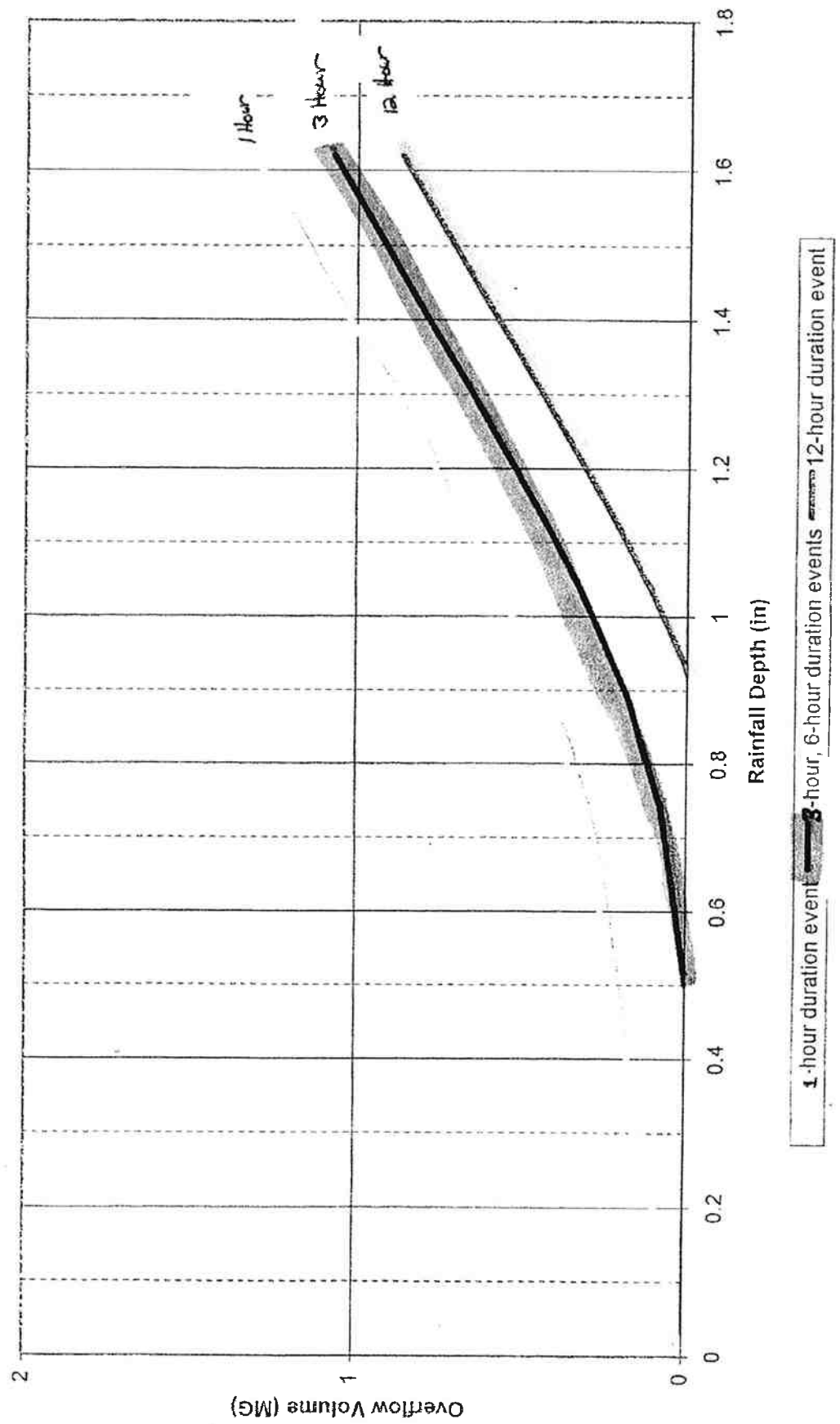


# **Discharge Point**

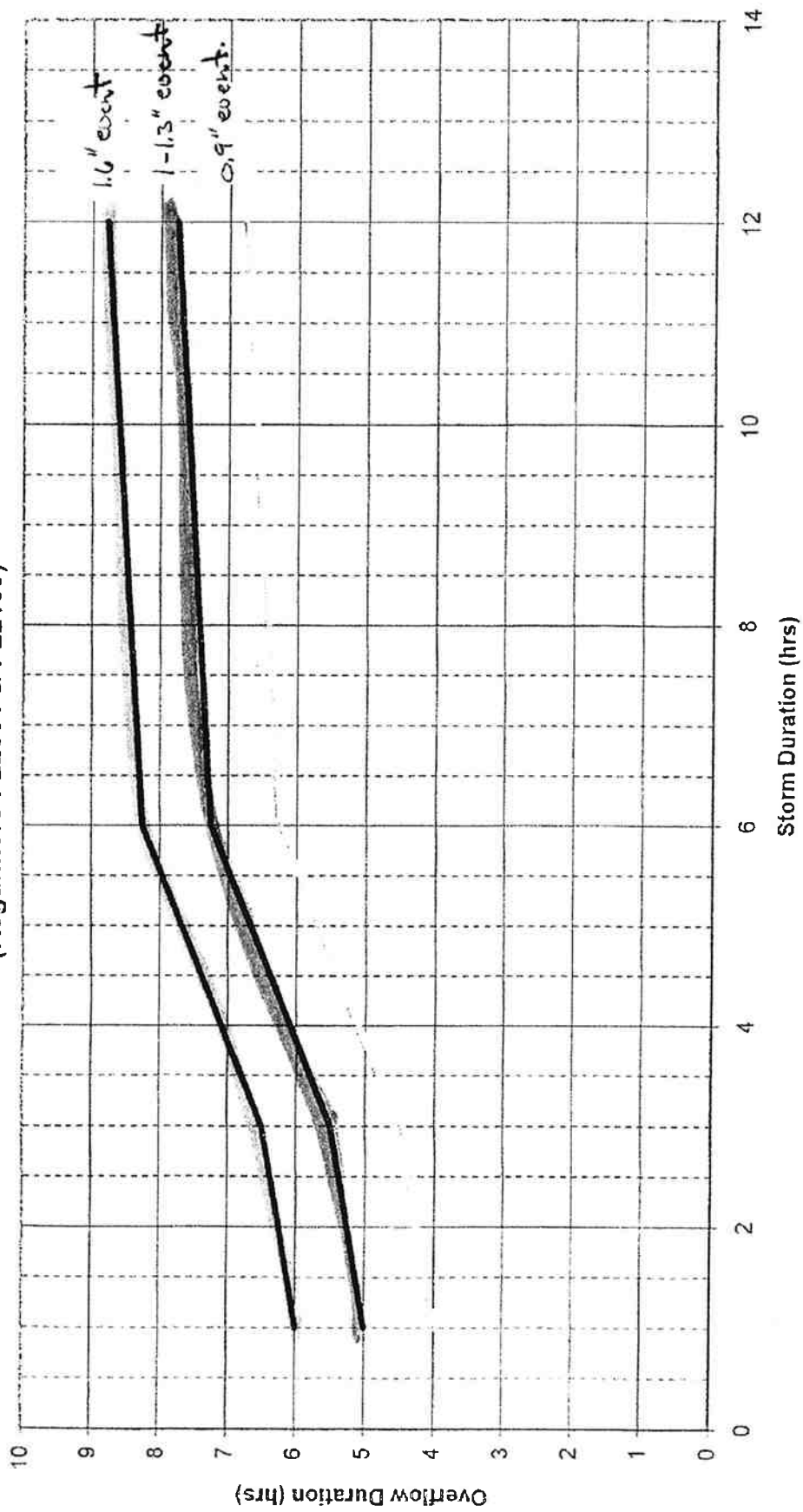
## **O22-004**



Estimated Single-Event Overflow Volumes  
 Discharge Point O22004  
 (Regulators P22001 & P22139)



Estimated Single-Event Overflow Duration  
 Discharge Point O22004  
 (Regulators P22001 & P22139)



0.9-inch depth event 1.1, 1.1, 1.3-inch depth events 1.6-inch depth event

## LONG TERM WATER QUALITY PLAN

### Current Overflow Events<sup>1</sup>

	<u>Reg. P22-139</u>	<u>Reg. P22-001</u>
Annual Overflow Volume	328,777 cf.	453,625 cf.
Annual Number of Overflows	17 ea.	45 ea.

### Planned Improvements

CSSCIP – Subbasin O22-061B is listed as priority number 20 of 39 subbasins for planned improvements. Preliminary Engineering Report was completed in June 2002, and the following alternatives were favored:

- 1) Construction of new storm sewers with public and private inflow removal.
- 2) Construction of new sanitary sewers and conversion of the combined sewers to storm sewers.

LTCP – No short term control is planned. During Stage 3 – Years 15 to 20, partial separation in subbasin O22-061B will allow regulators P22-001 and P22-139 and associated discharge point to be completely eliminated.

### Planned Overflow Events<sup>1</sup>

	<u>Reg. P22-139</u>	<u>Reg. P22-001</u>
Annual Overflow Volume	0 cf.	0 cf.
Annual Number of Overflows	0 ea.	0 ea.

<sup>1</sup> From Figure 10-1: City of Fort Wayne CSO LTCP. Estimated from system model.



## **Appendix C**

# **Vendor Responses**

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## CDS CSO SCREEN ALTERNATIVES

CSO NO	17	21	26	52
FLOW, CFS	19	22	72	8
FLOW, L/SEC	538.3	623.3	2039.8	226.6
PIPE SIZE, IN	42"	66"	72"	48"
DESCRIPTION	30' Access Road Very tight site	leaves dark plume best quality required	adjacent to pump sta 6 regulators to 2 CSOs	

### ALTERNATIVE #1 - RAKED BAR SCREEN - 4 MM SPACING

Bar Area, m2	1.08	1.25	4.08	0.45
Size / Model	10001	12001	10004	5001
Number	1	1	1	1
Budget Price	\$ 38,000.00	\$ 40,000.00	\$ 65,000.00	\$ 36,000.00
app footprint, ft	3.5 x 4.33	4.25 x 4.33	3.5 x 17.33	2 x 4.33
ht, inches	17	17	17	17
impact on HGL	+8 inches	+8 inches	+8 inches	+8 inches
Installation Cost	highly dependent on the details of the job. 50% of purchase price if no structure changes are needed. New structure can increase cost by 5 to 10 times.			

#### Notes

Budget price includes automation, equipment, mounting frame and covers in 304L ss

### ALTERNATIVE #2 - CDS GSS - 1 mm SCREENING (200 micron effective)

Size / Model	PSW70_70	PSW70_70	PSW100_80	PSWC56_53
Number	1	1	2	1
Budget Price	\$80,000	\$80,000	\$300,000	\$60,000
Automation	\$75,000	\$75,000	\$110,000	\$75,000
app footprint, ft	10' x 15'	10' x 15'	30' x 18'	10' x 12'
depth, ft	12'	12'	14'	11'
impact on HGL	7.30 ft	9.27 ft	9.31 ft	4.30 ft
Installation Cost	\$ 50,000	\$ 50,000	\$ 250,000	\$ 30,000

#### Notes

Budget price includes screens and other internals and precast manholes to contain the screen. Installation cost includes cost of diversion structure. Costs can be less in ideal soils, and can double in poor soils with a high water table. Automation costs include control panel, flow and level instrumentation, underflow pump and motor starter in cabinet.

## CDS CSO SCREEN ALTERNATIVES

### ALTERNATIVE #3 - CDS FSS - CHEMICALLY ENHANCED FLOCCULATION w/ CDS 1 mm SCREENS

Size / Model	PSW56_53	PSWC56_53	PSWC70_70	PSWC40_40
Number	3	3	6	3
Budget Price	\$350,000	\$350,000	\$750,000	\$250,000
area, mix tanks	633	733.3	1800	333
app footprint, mix tanks	22 x 33	24 x 38	39 x 55	18 x 28
app footprint, total	22 x 45	30 x 50	61 x 70	21 x 35
depth, ft	15	15	20	12
Impact on HGL	3.26 ft	3.85 ft	3.81 ft	2.57 ft
Civil for tanks				
Soil exc & disposal, yd3	623	1133	3479	272
Concrete structures, yd3	220	286	705	127
exc and dispose, \$/yd3	50	50	50	50
conc structures, \$/yd3	300	300	300	300
app civil costs	\$ 97,178	\$ 142,511	\$ 385,530	\$ 51,689
budget install costs	\$ 225,000	\$ 300,000	\$ 800,000	\$ 125,000

#### NOTES

Budget prices include the CDS unit internals and connecting piping, installation hardware, controls, instruments, mixing equipment, chemical storage and preparation equipment, and dosing pumps. Chemical sludge is much greater volume than the natural solids in the flow. No provisions are made here for dewatering or disposal.

No control buildings or buildings to house equipment, chemical makeup, control room, etc.

# CDS TECHNOLOGIES INC SCREENING PRODUCTS

---

For Treating Sanitary Wet Weather  
Flows (CSOs, SSOs & POTW By-  
Passes)



# PREMISE

- DIFFERENT SITES ...
  - With DIFFERENT CONDITIONS
    - And Requiring DIFFERENT TREATED WATER QUALITY
- ...create

## DIFFERENT TREATMENT REQUIREMENTS



# OUTLINE

REGULATORY FRAMEWORK

WATER QUALITY ISSUES

SCREENING OVERVIEW

CDS/COPA SCREENING REVIEW

CDS PERFORMANCE

FACILITY TOUR

COMPARATIVE COSTS

SUMMARY



# REGULATIONS

- CSO
  - PERMIT FOR DISCHARGE
  - 9 MINIMUM STANDARDS
- SSO
  - NOT PERMITTED – ILLEGAL DISCHARGE
  - BLENDING RULE ISSUED
- TMDL's



# CSO REGULATIONS

## ■ 9 MINIMUM STANDARDS

- PROPER OPERATION of the sewer system
- MAXIMIZE STORAGE in collection system
- Headworks review & modifications
- Maximize FLOW TO THE WWTP
- Eliminate DRY WEATHER FLOWS
- CONTROL OF SOLIDS AND FLOATABLES
- Pollution Prevention Programs
- Public Notification
- Monitoring ... CSO Impacts ... and ... Efficacy of Controls

## ■ LONG TERM CONTROL PLAN (LTCP)



# SSO REGULATIONS

- **BLENDING RULE**
  - **TREATMENT LIMITS**
    - No Requirement for % Reduction
    - Numerical Limits to Assure Water Quality Protection
  - **SECONDARY TREATMENT**
    - Doesn't mean biological treatment
    - Treatment to meet 'secondary' Water Quality

# TMDL'S

- QUALITY OF THE RECEIVING WATERS
  - STATED USE OF THE RECEIVING WATERS
  - CURRENT CONDITION
  - CONTRIBUTION OF THE DISCHARGE
- LOCAL INITIATIVES CONTROL

# WATER QUALITY ISSUES

- FLOATABLES, TRASH & DEBRIS
- SUSPENDED SOLIDS
- BACTERIAL LEVELS
- NUTRIENTS
  - Dissolved O<sub>2</sub>, Nitrogen, Phosphorus
- TOXICS
  - Hydrocarbons, Metals, Pesticides



# SCREENING OVERVIEW –

## ISSUES

- TECHNICAL ISSUES
  - PARTICLE SIZE REMOVAL
  - SCREENINGS HANDLING
  - REMOVAL EFFICIENCIES OF TARGETED POLLUTANTS
- COST ISSUES
  - INITIAL
  - OPERATIONS & MAINTENANCE

# SCREENING OVERVIEW – PRODUCTS

- NETTING SYSTEMS
- STATIC SCREENS
- MECHANICAL SCREENS
- CDS NON-MECHANICAL
- CDS AUTOMATED
- CDS WITH CHEMICAL FLOCCULATION



# SCREENING PRODUCTS – PARTICLE SIZE REMOVAL

<u>SCREEN TYPE</u>	<u>LOWEST SIZE REMOVAL</u>
NETTING	12 mm (1/2" ) (2-DIMENSIONS)
STATIC SCREENS	2 mm (.08 in) (2-dimensions)
MECHANICAL SCREENS	4 mm (.15 in) (1 or 2 dimensions)
CDS (All Types)	.25 mm (.01 in) (2+ dimensions)
CDS (With Floccing)	.001 mm (1 micron) (2+ dimensions)

# SCREENING PRODUCTS – SCREENINGS HANDLING

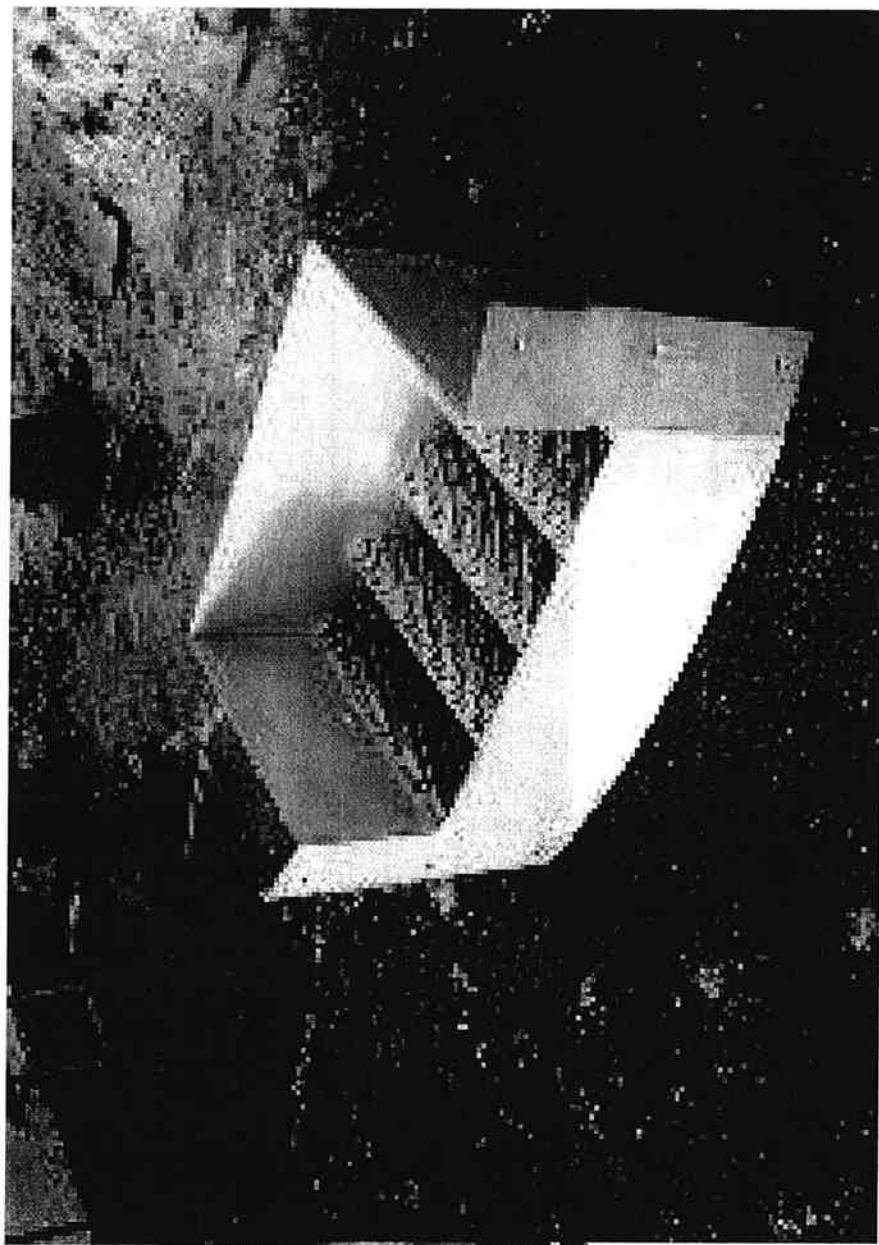
<u>SCREEN TYPE</u>	<u>SCREENINGS HDLG.</u>
NETTING	STORED
STATIC SCREENS	STORE – LIMITED VOL / UNDERFLOW TO COLLECTION
MECHANICAL SCREENS	PASS THROUGH - UNDERFLOW TO COLLECTION
CDS NON-MECH'L	STORE
CDS AUTOMATED	PUMP TO S. SEWER



# SCREENING PRODUCTS – REMOVAL EFFICIENCIES / TARGETED POLLUTANTS

SCREEN TYPE	REMOVAL EFFICIENCY, %			
	TSS	O <sub>2</sub> DEMAND	NUTRIENT	TOXIC
NETS	0-10	5-10	MIN	MIN
STATIC	20-30	5-10	MIN	MIN
MECHANICAL	10-20	5-10	MIN	MIN
CDS – NO CHEM	40-70	20-40	10-30	20-50
CDS – FLOCCING	90-99	40-70	P – 85 N - 40	40-70

# COPA CROSS WAVE (STATIC SCREEN)



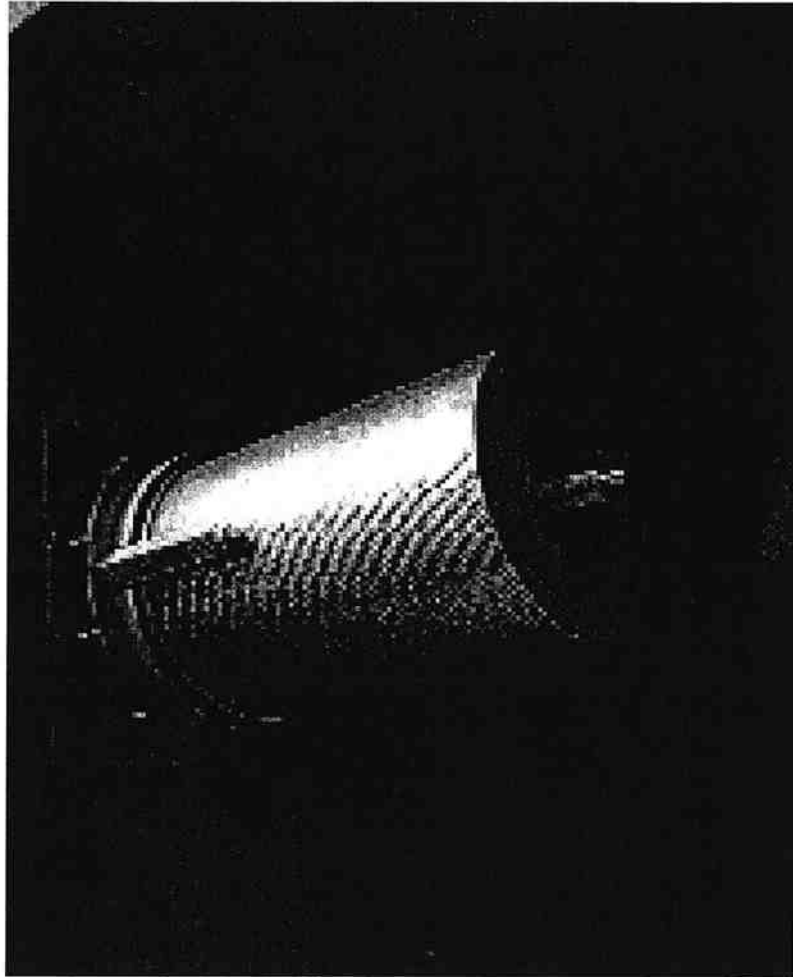
# CDS & COPA SCREENING PRODUCTS

## STATIC SCREENS – CROSS WAVE

- USES:
  - STORAGE FACILITY OVERFLOWS
  - CSO's WITH < 10 DISCHARGES / YEAR
  - LIMITED DURATION EVENTS
- FEATURES
  - Up-flow, solids accumulate underneath
  - Solids release when flow subsides
  - Clean every 3 to 6 events
  - Use on regulator or at the discharge point



# COPA CYCLONE SCREEN



# CDS & COPA SCREENING PRODUCTS

## CYCLONE SCREEN –

- USES
  - Smaller (Low Flow) Regulators
- FEATURES
  - Self Powered by Internal Waterwheel
  - 6 mm Perforated Screen
  - Flow in sewer carries screenings to Interceptor



# COPA RAKED BAR SCREEN



# CDS & COPA SCREENING PRODUCTS

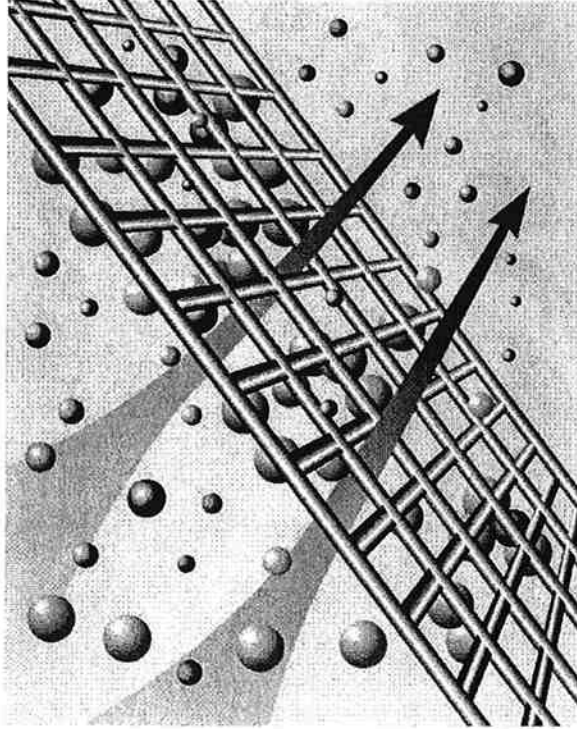
## COPA RAKED BAR SCREEN

- USES
  - Any Flow Capacity
  - Overflows Before Discharge
  - Pretreat Flow into Storage Facilities
  - Protect Pump Stations
- FEATURES
  - Screen to 4 mm
  - Hydraulic Rake Mechanism
  - Horizontal Screen
  - Need Flow into Interceptor

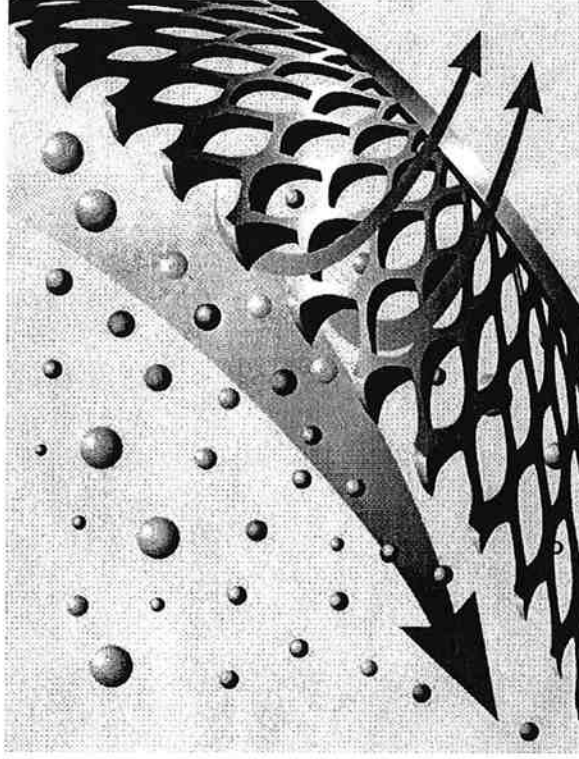


# CDS TECHNOLOGY BASIS

- Strong washing effect of incoming fluid keeps screen free of pollutants
- Conventional devices rely on direct screening - screens become blocked

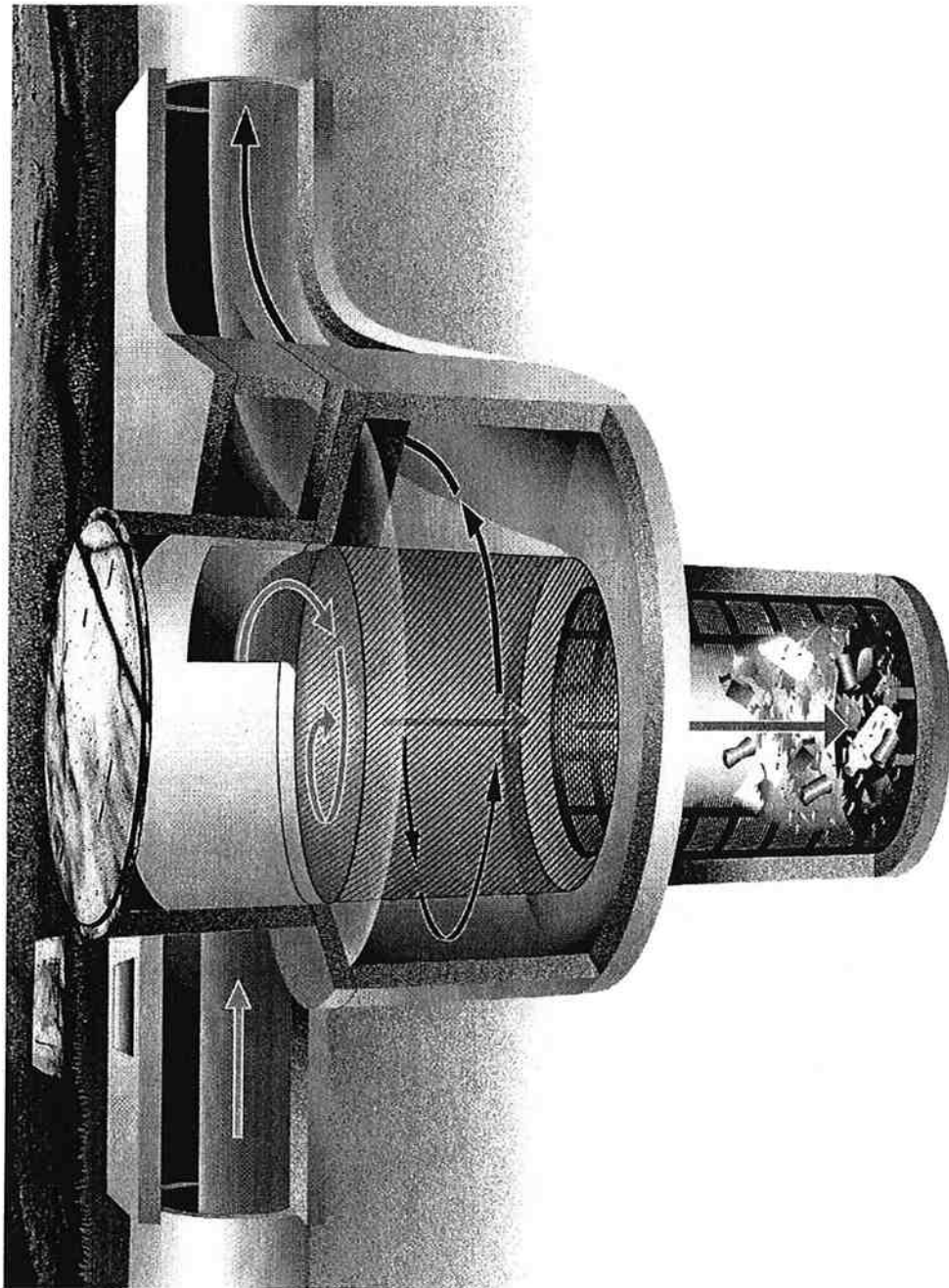


Direct screening - solids become caught on screen

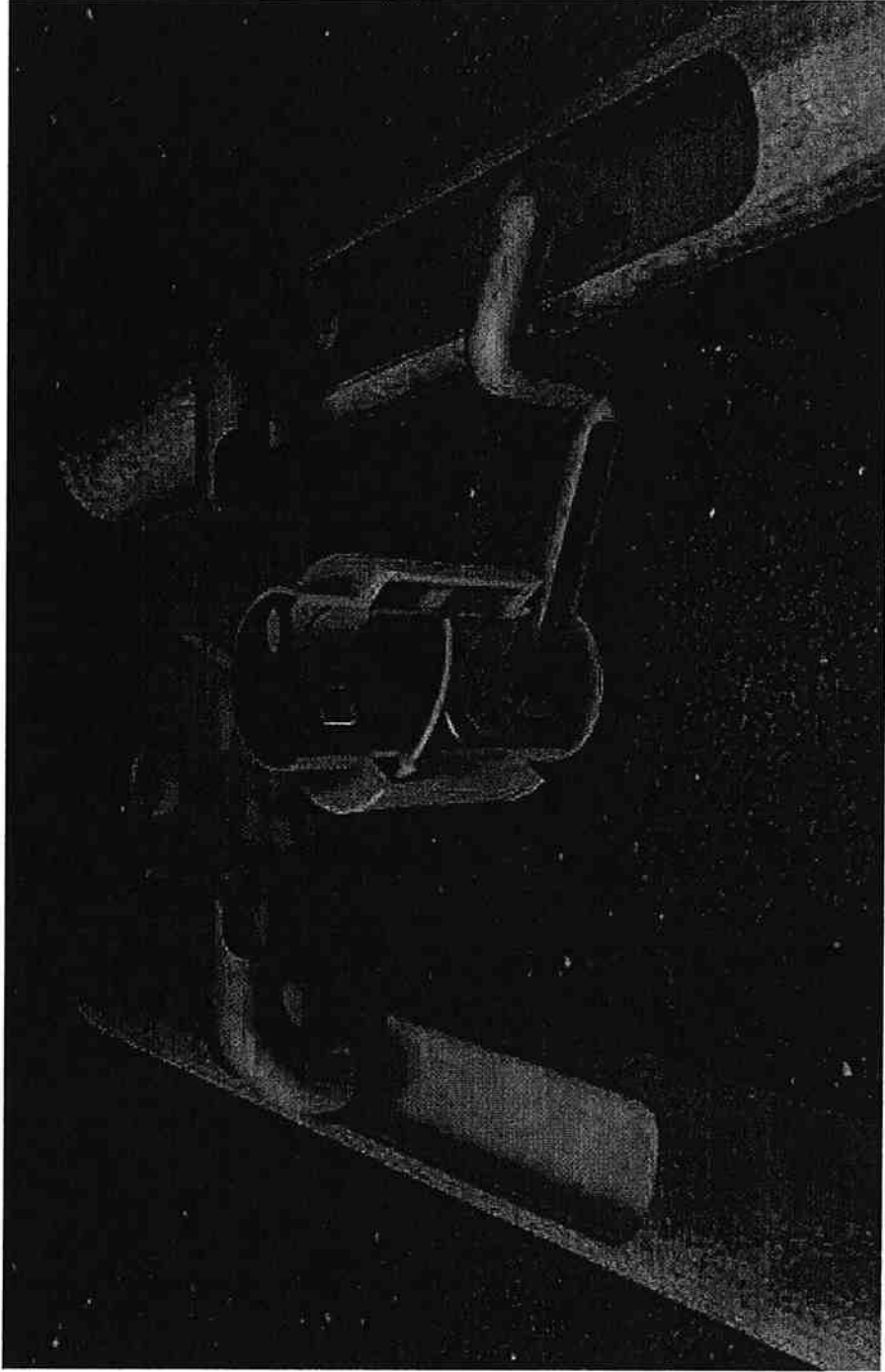


Indirect screening - solids swept past screen

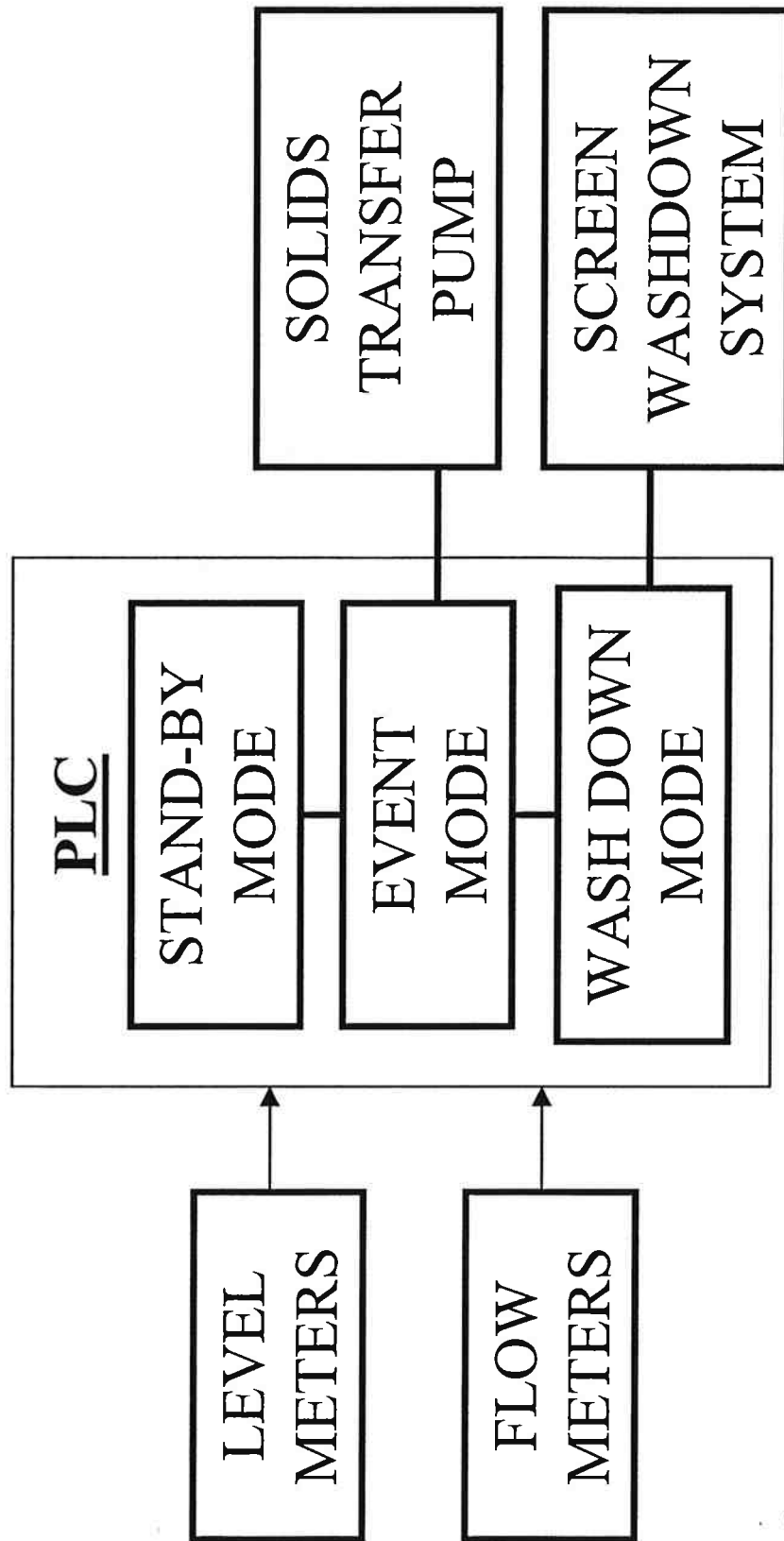
# CDS SCHEMATIC



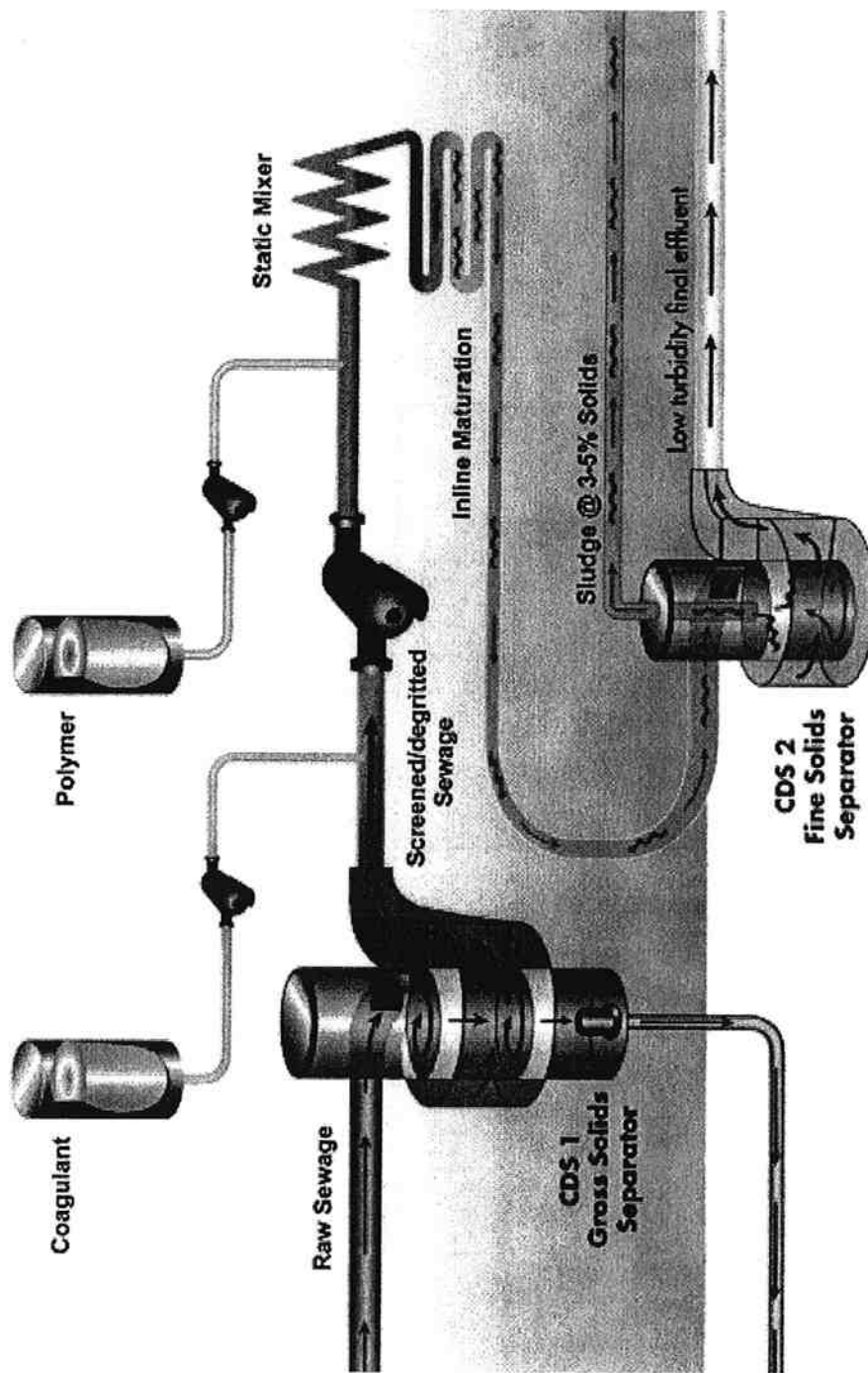
# AUTOMATED CDS – FLOW SCHEMATIC



# AUTOMATED CDS - CONTROLS



# CDS FSS FLOCCING SYSTEM

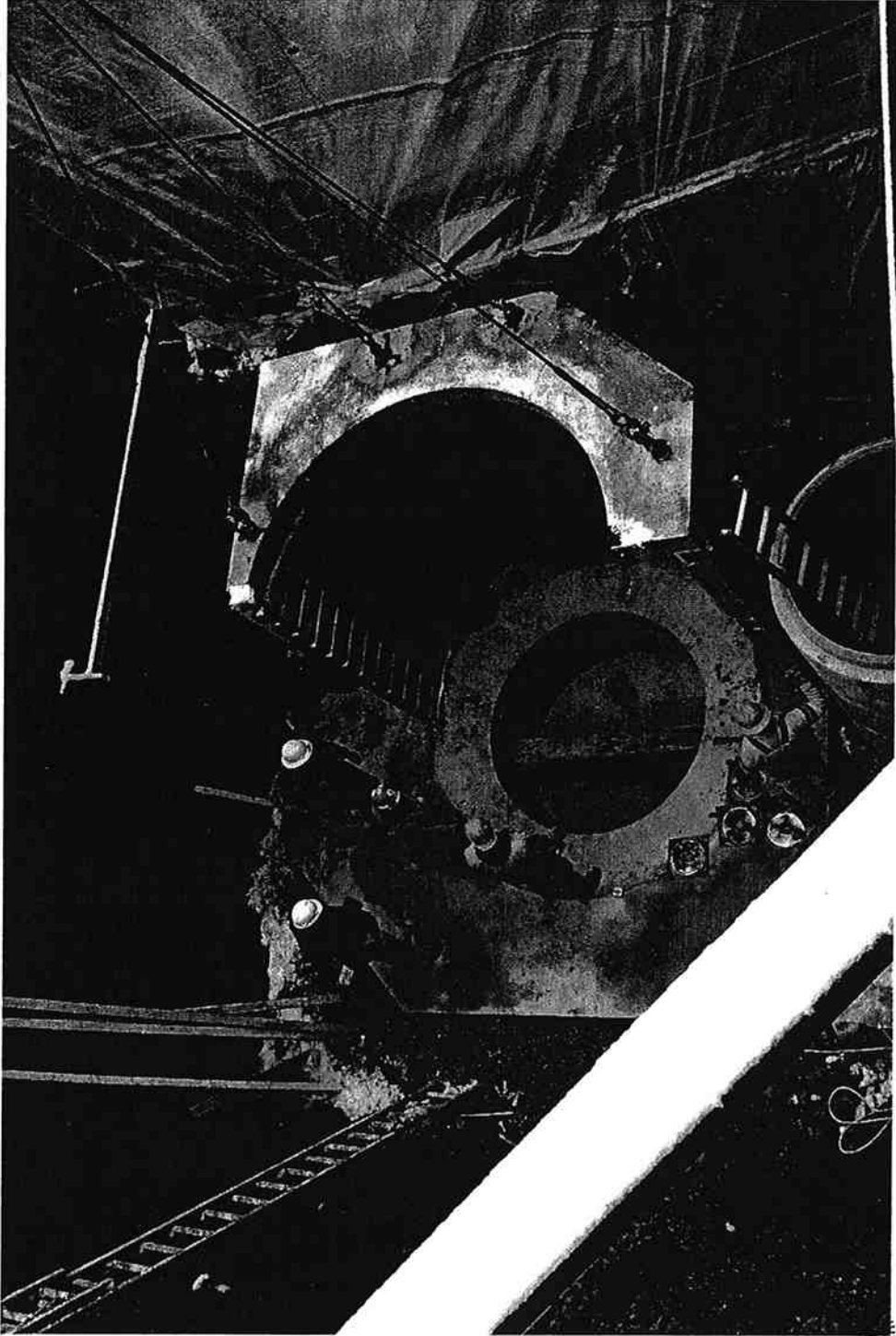


# CDS CSO FACILITIES

AUTOMATED		
LOUISVILLE, KY CSO 108	35 CFS	DUAL 7' DIA X 7' TALL
COHOES, NY OUFFALL #9	40 CFS	10' DIA X 10' TALL
MANUAL		
AKRON, IN	2. CFS & 6. CFS	3' DIA X 2' TALL 5' DIA X 4' TALL
LOUISVILLE, KY CSO 50	8. CFS	5' DIA X 5' TALL

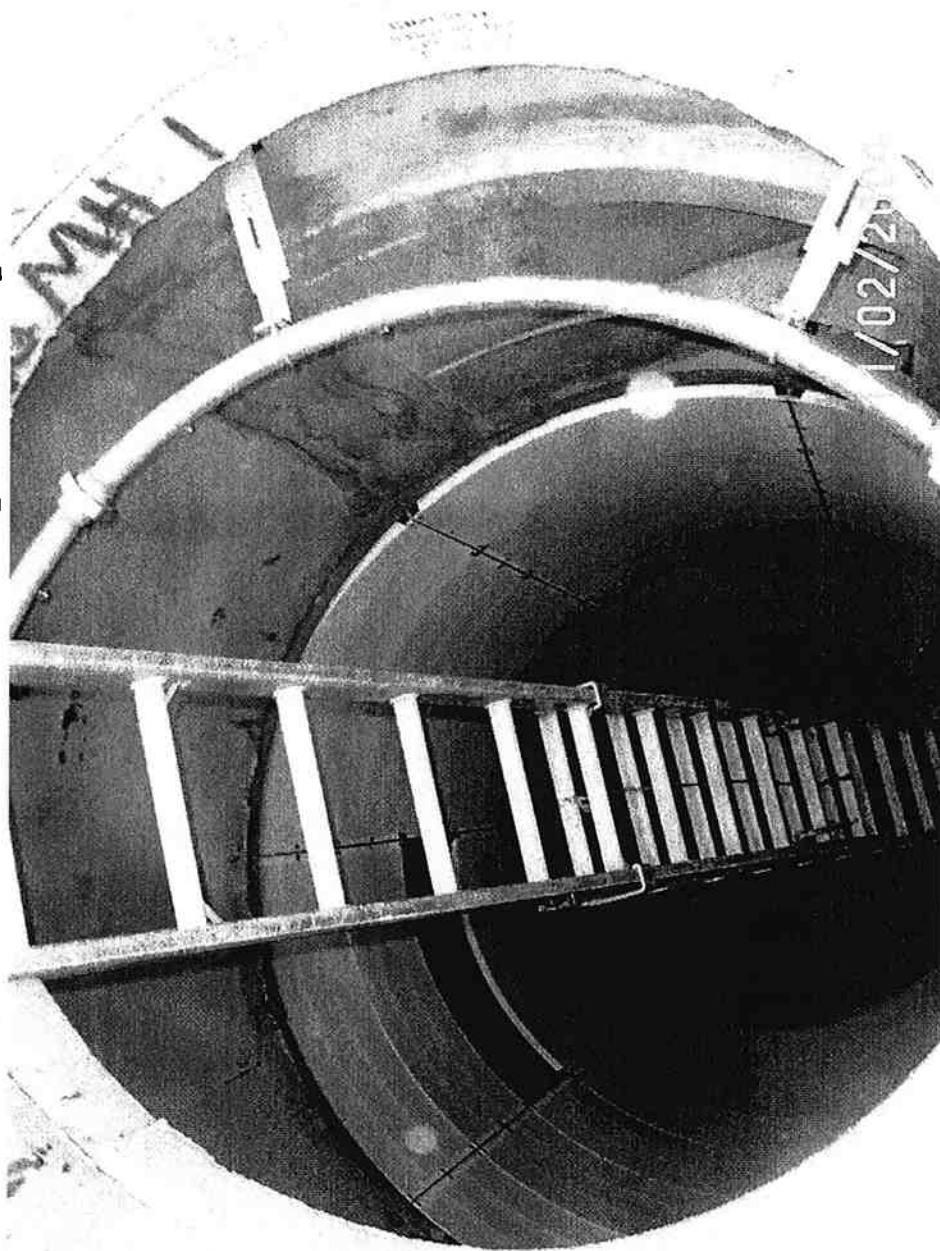


# CDS CONSTRUCTION – COHOES

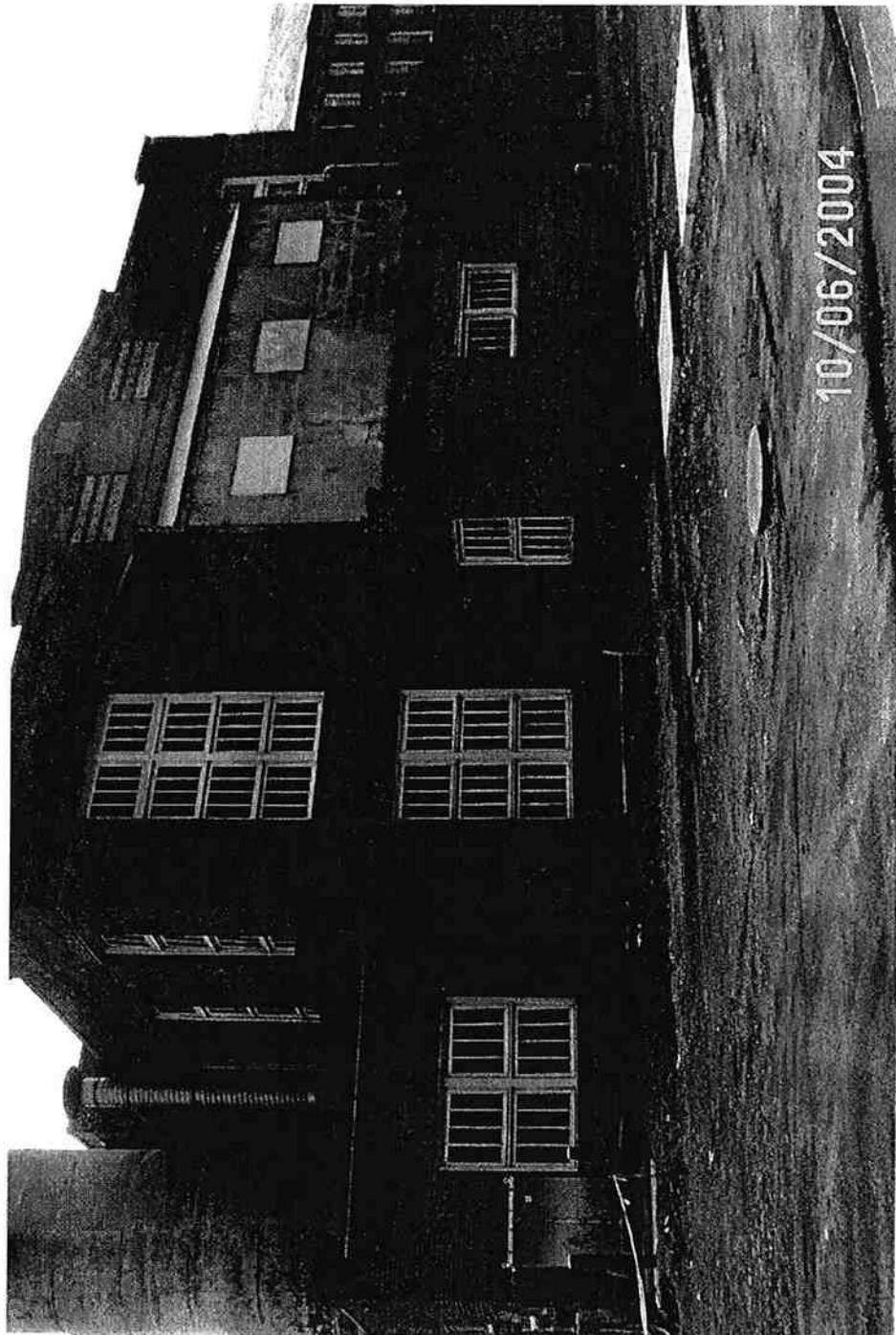


**CDS**  
TECHNOLOGIES

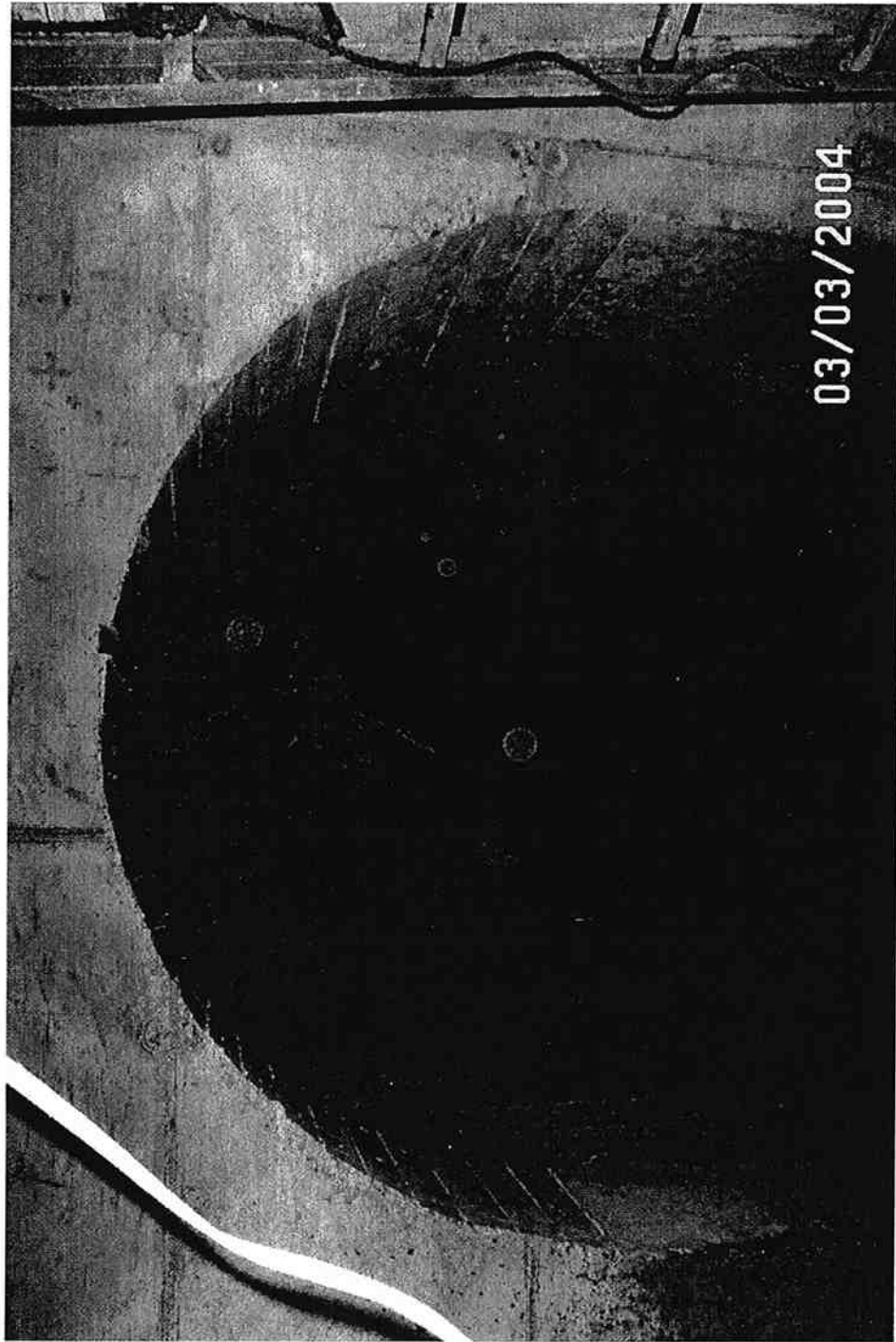
# CDS GROSS SOLIDS SEPARATOR (GSS)



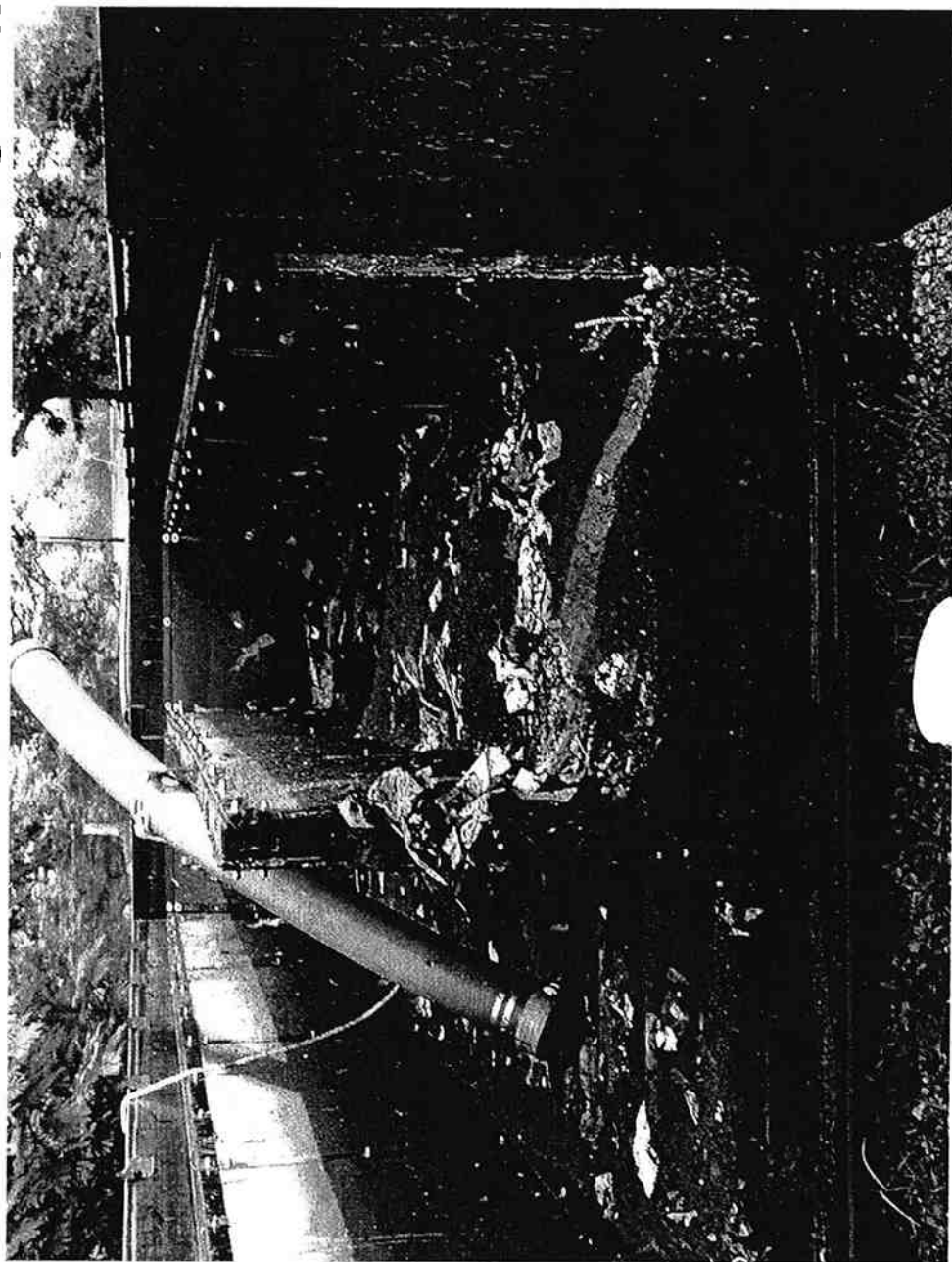
# CDS CONSTRUCTION – COHOES



# CDS CONSTRUCTION - COHOES



# CDS PERFORMANCE – LOUISVILLE



# CDS PERFORMANCE – LOUISVILLE



# CDS PERFORMANCE – LOUISVILLE

POLLUTANT	AS SAMPLED		MASS BALANCE		
	INLET mg/l	OUTLET mg/l	INLET	OUTLET T	SUMP
TSS	63	33	1447 mg/l	248 mg/l	
	75	144	1207 lb		
	341	566		207 lb	1000 lb
SSC-B	114	38	1287 mg/l	87.5 mg/l	
	74	137	1073 lb	73 lb	1000 lb
TTS Removal %			82.9%		
SSC Removal %			93.2%		



# CDS PERFORMANCE – SOLIDS CHARACTERIZATION

WET WEIGHT	2638 LB	
DRY WEIGHT	1000 LB	37.9% dry solids
TRASH	35 LB	3.5 %
ORGANIC	724 LB	72.4 %
INORGANIC	241 LB	24.1 %



# CDS PERFORMANCE – SOLIDS CHARACTERIZATION

WET WEIGHT	2638 LB	
DRY WEIGHT	1000 LB	37.9% dry solids
TRASH	35 LB	3.5 %
ORGANIC	724 LB	72.4 %
INORGANIC	241 LB	24.1 %

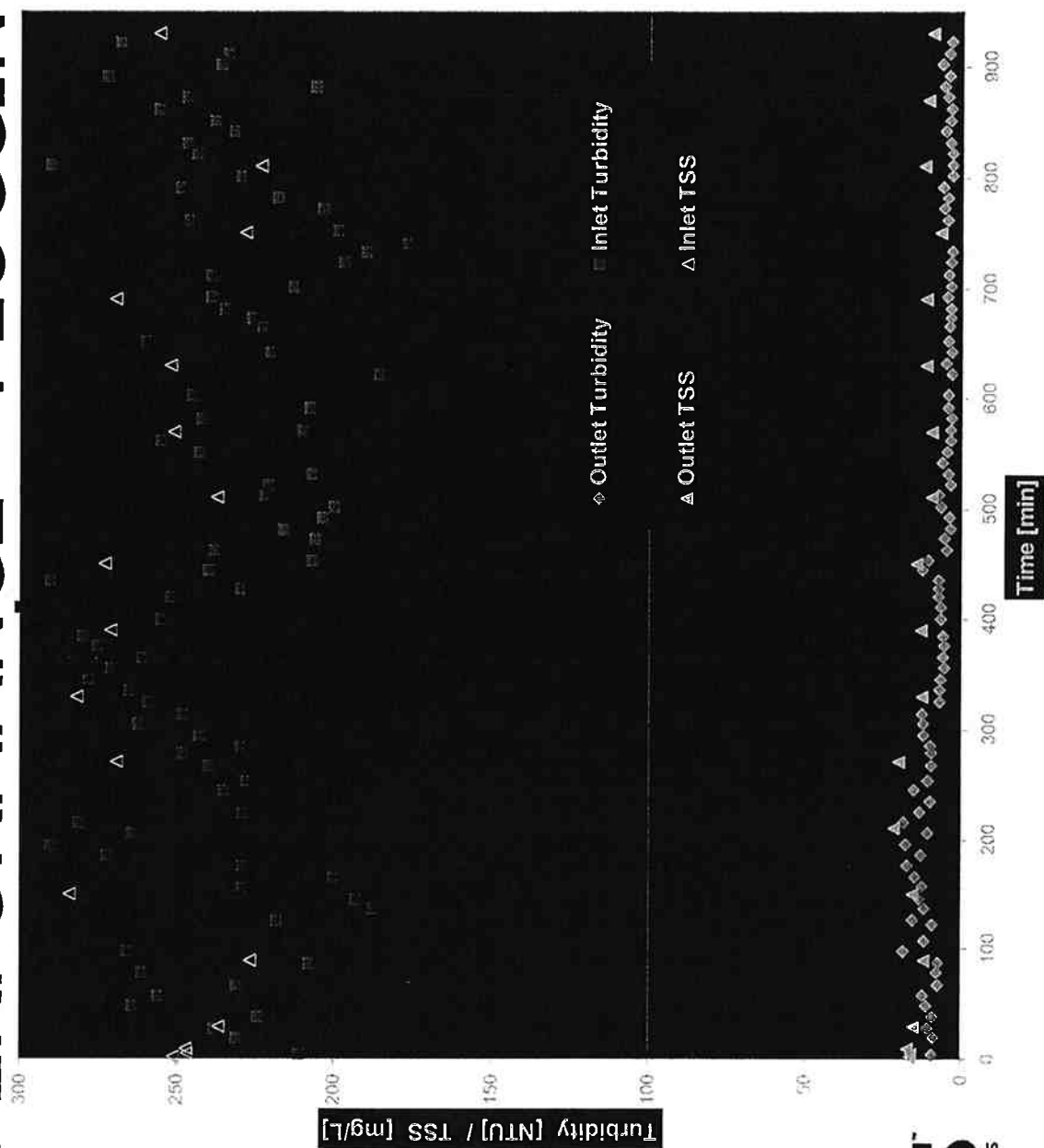


# CDS PERFORMANCE – FLOCCING

Parameter	Unit	Raw (Range)	Treated (Range)	% Rem.
<b>Turbidity</b>	[NTU]	240 (177-369)	7.6 (3.4-15.2)	97%
<b>TSS</b>	[mg/L]	259 (184-564)	13.5 (4-22)	95%
<b>BOD<sub>5</sub> *</b>	[mg/L]	302 (190-420)	38 (25-46)	87%*
<b>COD *</b>	[mg/L]	531 (454-643)	82 (76-85)	80%*
<b>Faecal Coliforms</b>	[CFU per 100mL]	1.3x10 <sup>7</sup> (5.4-17x10 <sup>6</sup> )	5.8x10 <sup>4</sup> (3-11 x 10 <sup>4</sup> )	99.5%
<b>TP</b>	[mg/L P]	12 (9.7-17.2)	0.6 (0.4-0.7)	95%
<b>TN</b>	[mg/L N]	71 (60-85)	55 (49-59)	16%
<b>Ammonia</b>	[mg/L]	40 (28-45)	37 (34-39)	8%



# CDS PERFORMANCE - FLOCCING



# COMPARATIVE COSTS – DESIGN BASIS

- 80 MGD PEAK FLOW FACILITY
- EXISTING OUTFALL
- REQUIRES NEW CONTROL STRUCTURE
- EQUIPMENT & CONSTRUCTION COSTS
  - NO LAND, RIGHT-OF-WAY COSTS
  - NO UNUSUAL CONDITIONS

# COMPARATIVE COSTS & FOOTPRINT

SYSTEM	CAPITAL COST INSTALLED	FOOTPRINT
4 mm RAKED BAR SCREEN	\$400,000 to \$500,000	30' X 8' or 15' x 12'
CDS – GSS SCREENING	\$1.8 to \$2.2 million	50' x 30'
CDS – FSS W/ FLOCCULATION	\$2.9 to \$3.4 million	80' x 50'



# SUMMARY

- CDS-GSS PROVIDES A HIGHER LEVEL OF SCREENING PERFORMANCE THAN CURRENT CSO SCREENS
- WITH FLOCCULATION THE CDS-FSS SYSTEM CAN ACHIEVE NEAR SECONDARY EFFLUENT LIMITS.
- THEY PROVIDE ECONOMICAL ALTERNATIVE WAYS TO ACHIEVE HIGHER QUALITY DISCHARGE LIMITS THAN CONVENTIONAL SCREENING PROVIDES



# SUMMARY

- WET WEATHER FLOWS ARE VERY DIFFICULT TO SAMPLE AND NO ONE KNOWS HOW TO DO IT ON A LARGE SCALE.



# FAX COVER SHEET

Fresh Creek Technologies, Inc.

1425 Pompton Ave Suite 1-2

Cedar Grove, NJ 07009

PHONE (973) 237-9099

FAX (973) 237-0744

FROM: Mike Farrelly *MF*

TO: Rita Fordiani

DATE: 9/27/04

FAX: (773)691301

Page 1 of 9 including cover sheet

\*\*\*\*\*

Rita,

If you have any questions please contact me at (973) 237-9099

Thanks.





1425 Pompton Ave., Cedar Grove, NJ 07009  
Tel (973) 237-9099, Fax (973) 237-0744

**CONFIDENTIAL**

**Attention:** Ms. Rita Fordiani, PE.  
CH2M Hill  
40 Tanbark Road  
Sudbury, MA 01776

**Subject:** Midwest CSOs  
Floatables Collection System

Dear Ms. Fordiani,

Fresh Creek Technologies, Inc. is pleased to present our Proposal P-10476, for the design, fabrication delivery and installation support of four (4) Inline Netting TrashTrap® systems for installation at four (4) locations in the Midwest. Our proposal is based on your 9/17/04 phone conversation with our Robert Kircher, engineering manager.

**Description of the Netting TrashTrap® Technology**

The Fresh Creek Technologies, Inc. Netting TrashTrap® system is a low cost, modular, prefabricated floatables collection system that is easy to install, operates unattended and requires no external power. Netting TrashTrap® systems use the natural energy of the flow to drive the trash or floatable materials into disposable mesh nets. Also, due to the downward design of most CSO and stormwater piping, the equipment is designed to drain dry. This feature eliminates the possibility of standing water, which is the breeding ground for mosquito (vector) propagation. Recently reported cases of West Nile virus make this feature of Fresh Creek's equipment an extremely important one from an environmental and health standpoint. The Fresh Creek Technologies, Inc. literature (enclosed), describes the Netting TrashTrap® technology in more detail.

Benefits of the Netting TrashTrap® systems are High Capture Efficiencies - above 98%, Low Installation Cost, and Low Operation and Maintenance Costs. The Netting TrashTrap® technology is included in US EPA CSO guidance documents. It implements both the "Nine Minimum Controls" and Long Term Control floatables requirements of the US EPA and has been approved for use in New Jersey by the NJ DEP.

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Fresh Creek's Netting TrashTrap® System, meets and/or exceeds the Full Capture Treatment System requirements identified in the California Regional Water Quality Control Board (RWQCB), Los Angeles Region's Trash Total Maximum Daily Load (TMDL) for the Los Angeles River Watershed. The FCT Netting TrashTrap® system is the only netting system presently approved by the Los Angeles RWQCB.

### Site Location

Based on the supplied information, FCT is proposing four (4) Inline Netting TrashTrap® systems, sized to accommodate the required design flows as follows:

<u>CSO</u>	<u>Qty</u>	<u>No. of Nets</u>	<u>Size of Nets</u>	<u>Flow Rate</u>	<u>Pipe Dia.</u>
#17	1	1	30" x 30" x 8' x ½" mesh	19 CFS	42"
#21	1	1	30" x 30" x 8' x ½" mesh	22CFS	66"
#26	1	3	30" x 30" x 8' x ½" mesh	72 CFS	72" & 84" **
#52	1	1	30" x 30" x 8' x ½" mesh	8 CFS	48"

\*\* To be combined into one (1) pipe 8' in diameter by others

The overall systems and equipment of the netting system will be designed to process 100% of design flow via the nets. Any additional flow above this design flow rate will pass over the top of the netting internal support structure and will be processed through stainless steel screening material with ½" gaps. Therefore, the entire flow being transmitted through the CSO pipe will be screened for floatables of ½" or larger in size.

Each FCT Inline Netting TrashTrap® system will be in a dedicated concrete chamber. The concrete chambers will be supplied as a multi-piece precast structures. The nets will be inside lift baskets, which will be raised to grade level, at the time net replacement is needed. **NO** "Confined Space Entry" will be required. Because there is to be no street traffic at three (3) sites, the lift baskets at those sites will be accessed through 300 PSI rated hinged doors, which will be pre-cast into the concrete chamber lids. The site bearing intermittent traffic will have hinged doors rated for AASHTO H-20 wheel loading. All structural internals and hardware will be 316 stainless steel.

Because of the flow velocities that may be encountered at these sites, FCT is proposing the use of our standard 1/2" opening mesh net.

The mounting system for the netting support frame will be sized for the design flow discharging from of the outfall, during a rain/CSO event.

All mounting/anchoring will be "drill-in" type anchors and drilled into the concrete bottom and sidewalls of the concrete chamber walls. All FCT supplied equipment will use 316 stainless steel, anchors and hardware will also be 316 stainless steel.

Our general experience is that Netting TrashTrap® systems may require servicing one, two or more times a month during the wet weather season. The actual service interval is very site specific and depends on rainfall frequency, and the amount of trash that enters the CSO system. FCT recommends that the equipment and nets be inspected after every significant rain event.

Servicing the system is done using a truck equipped with a crane capable of extending out over the system to each of the nets and with a capacity to lift up to 2000 pounds at this reach. The weight of the lifting basket and net is approximately 500 pounds (without trash). The procedure is simple. The lift basket with the used net, is lifted through the open access opening (via crane type lifting equipment) and put on the ground. The used net is removed from the lifting basket using the same crane and put into a watertight dumpster for transport to a transfer station or landfill. We estimate that an experienced crew will be able to change out the net in less than 1 hour or less, per CSO site.

### **Scope of Supply/Work**

#### **I. Equipment to be supplied**

##### **A. Netting TrashTrap® System @ CSO #17**

1. One Inline Netting TrashTrap® System Model ILNTT-1, consisting of one (1) net support frame & one lifting basket, hinged screening, access ladder, inside a multi-section pre-cast concrete chamber and all hardware required for installation.

The above listed equipment will consist of the following fully described components, in the concrete chamber:

- A. One (1) 316 stainless steel net support and frame mounting system.
- B. One (1) 316 stainless steel net lifting basket and bridle.
- C. One (1) lot, 316 stainless steel 1/2 inch opening, hinged bar screen and appurtenances.
- D. One (1) 316 stainless steel access ladder, underneath the netting access doors.

- E. One (1) concrete chamber, precast (in FCT's mold) by Oldcastle/Rotondo to the FCT design. The chamber will be 4'-0" wide by 16'-0" long by approximately 10'-0" high, (inside dimensions), with precast openings to match up with the CSO piping. The access opening for the chamber will be a 300 PSI rated hinged door (4'-0" wide by 7'-0" long inside dimensions), and a 30" square 300 PSI rated hinged man-door, both are pre-casted into the concrete chamber lid section.
- F. One (1) set of access ladder rungs, underneath the manhole.
- 2. Eighteen (18) disposable standard duty ½" mesh nets with plastic frames, size is 2'-6" by 2'-6" (opening at mouth) by 8'-0" long (nominal). This quantity of nets equals the initial setup set, plus 17 change-outs.
- 3. All 316 stainless steel hardware and fittings required for the assembly and installation of the system.

**B. Netting TrashTrap® System @ CSO #21**

- 1. One Inline Netting TrashTrap® System Model ILNTT-1, consisting of one (1) net support frame & one (1) lifting basket, hinged screening, access ladder, inside a multi-section pre-cast concrete chamber and all hardware required for installation.

The above listed equipment will consist of the following fully described components, in the concrete chamber:

- A. One (1) 316 stainless steel net support and frame mounting system.
- B. One (1) 316 stainless steel net lifting basket and bridle.
- C. One (1) lot, 316 stainless steel 1/2 inch opening, hinged bar screen and appurtenances.
- D. One(1) 316 stainless steel access ladder, underneath the netting access doors.
- E. One (1) concrete chamber, precast (in FCT's mold) by Oldcastle/Rotondo to the FCT design. The chamber will be 7'-6" wide by 17'-0" long by approximately 10'-0" high, (inside dimensions), with precast openings to match up with the CSO piping. The access opening for the chamber will be a 300 PSI rated hinged door (4'-0" wide by 7'-0" long inside dimensions), and a 30" square 300 PSI rated hinged man-door, both are pre-casted into the concrete chamber lid section.

- F. One (1) set of access ladder rungs, underneath the manhole.
- 2. Eighteen (18) disposable standard duty 1/2" inch mesh nets with plastic frames, size is 2'-6" by 2'-6" high (opening at mouth) by 8'-0" long (nominal). This quantity of nets equals the initial setup set, plus 17 change-outs.
- 3. All 316 stainless steel hardware and fittings required for the assembly and installation of the system.

**OPTION:** Because this chamber is required to match the existing pipe diameter, a second net could be added to this site (only) for a slight additional charge. This would double of the capacity of the Netting Trash Trap® System at this site.

**C. Netting TrashTrap® System @ CSO #26**

- 1. One Inline Netting TrashTrap® System Model ILNTT-3, consisting of one (1) net support frame & three (3) lifting baskets, hinged screening, access ladder, inside a multi-section pre-cast concrete chamber and all hardware required for installation.

The above listed equipment will consist of the following fully described components, in the concrete chamber:

- A. One (1) 316 stainless steel net support and frame mounting system.
- B. Three (3) 316 stainless steel net lifting baskets and bridles.
- C. One (1) lot, 316 stainless steel 1/2 inch opening, hinged bar screen and appurtenances.
- D. One (1) 316 stainless steel access ladder.
- E. One (1) concrete chamber, precast by Oldcastle/Rotondo to the FCT design. The chamber will be 13'-4" wide by 19'-4" long by approximately 10'-0" high, (inside dimensions), with precast openings to match up with the CSO piping. The access opening for the chamber will be a 300 PSI rated triple access hinged door, and a 30" square 300 PSI rated hinged man-door, both are pre-casted into the concrete chamber lid section.
- F. One (1) set of access ladder rungs, underneath the manhole.
- 2. Fifty-four (54) disposable standard duty 1/2" inch mesh nets with plastic frames, size is 2'-6" by 2'-6" high (opening at mouth) by 8'-0" long (nominal). This quantity of nets equals the initial setup set, plus 17 change-outs.

3. All 316 stainless steel hardware and fittings required for the assembly and installation of the system.

**D. Netting TrashTrap® System @ CSO #52**

1. One Inline Netting TrashTrap® System Model ILNTT-1, consisting of one (1) net support frame & one (1) lifting basket, hinged screening, access ladder, inside a multi-section pre-cast concrete chamber and all hardware required for installation.

The above listed equipment will consist of the following fully described components, in the concrete chamber:

- A. One (1) 316 stainless steel net support and frame mounting system.
  - B. One (1) 316 stainless steel net lifting basket and bridle.
  - C. One (1) lot, 316 stainless steel 1/2 inch opening, hinged bar screen and appurtenances.
  - D. One (1) 316 stainless steel access ladder, underneath the netting access doors.
  - E. One (1) concrete chamber, precast (in FCT's mold) by Oldcastle/Rotondo to the FCT design. The chamber will be 4'-0" wide by 16'-0" long by approximately 10'-0" high, (inside dimensions), with precast openings to match up with the CSO piping. The access opening for the chamber will be a H-20 rated triple access hinged door, and a 30" square H-20 rated hinged man-door, both are pre-casted into the concrete chamber lid section.
  - F. One (1) set of access ladder rungs, underneath the manhole.
2. Eighteen (18) disposable standard duty 1/2" inch mesh nets with plastic frames, size is 2'-6" by 2'-6" high (opening at mouth) by 8'-0" long (nominal). This quantity of nets equals the initial setup set, plus 17 change-outs.
  3. All 316 stainless steel hardware and fittings required for the assembly and installation of the system.

**NOTE:** The use of a 4' wide chamber here is contingent upon the chamber matching up to the outer diameter of the existing 48" pipe.

## II. Construction Supervision and Training

1. Fresh Creek Technologies will supervise the installation of equipment and include an overall work site inspection report at the completion of all work, for each site.
2. Following the completion of the project, Fresh Creek Technologies will conduct an operations and maintenance training program. Training shall be structured to develop a basic understanding of the design, function and capabilities of the equipment. In addition, routine operational and preventive maintenance, safety considerations, responses to abnormalities and startup, shutdown and troubleshooting will be covered. O & M manuals will be provided by Fresh Creek.

**NOTE:** Installation of FCT supplied equipment/items is by others. Installation includes but is not limited to: site preparation, crane to offload and install the concrete chamber, offloading and installation of FCT supplied internals, modifications to & tie-in to the existing piping and/or return area to original condition.

## III. Pricing, Terms and Conditions

As requested, budgetary prices will be provided. The cost of stainless steel has risen sharply over the last 12 months amounting to increases of over 100% for certain grades. This is an important factor for design and costing issues. Some stability has returned to this market pricing, but it is too early to predict where prices will be 6-12 months from now.

The budgetary proposal price for the Fresh Creek Technologies, Netting TrashTrap® systems, as described above as follows:

Netting TrashTrap® System at CSO #17	Price = \$ 97,500.00
Netting TrashTrap® System at CSO #21	Price = \$124,250.00
Netting TrashTrap® System at CSO #26	Price = \$219,350.00
Netting TrashTrap® System at CSO #52	Price = \$ 98,675.00

The above proposal prices for the Fresh Creek Technologies, Netting TrashTrap® systems, includes on shipping costs, to the job site. Additional nets are available for \$125.00 each, plus freight when ordered in a minimum quantities.

Payment terms are net 30 days from the day the Fresh Creek Technologies equipment is shipped.

This FCT pricing is to be handled with "strictest confidence", therefore not to be communicated in any way (verbal, written, faxed, emailed, etc.) to anyone outside of your department and FCT, without FCT's written knowledge and approval.

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#### IV. Comments

Submittals drawings and structural calculations (both including requirements under chambers) will be supplied 4 to 6 weeks of receipt of notice of the award of contract and verified piping inverts and grade elevation, whichever is later.

Delivery of the system to the site is 6 to 8 weeks after receipt of the approval of these submittals.

We estimate that the precast concrete sections can be installed in less than 1 day per site based on a good crane operator and at least four workers. The other FCT supplied equipment/items can be completely installed (by the installing contractor) within 2 days per site, using a crew of three (3) laborers, all required equipment and tools on the site.

The design & installation drawings and required calculations will be signed by a State of \_\_\_\_\_ licensed professional engineer.

Fresh Creek can provide contract services for maintenance and netting replacement. We presently have contracts with several Northern New Jersey cities. We would be pleased to quote a manual service contract for this installation.

#### General Comments:

Thank you for the opportunity to present this proposal. We look forward to discussing this proposal and our Netting TrashTrap® technology in more detail.

Sincerely,

  
Mike Farrelly  
Project Engineer

Reviewed by

  
Robert Kircher  
Engineering Manager

For each of the four sites, we have selected the appropriate equipment, determined the approximate required footprint and a budget price. The footprint is expressed in width and length, the width being equal to the required weir length to accommodate the equipment selected, including the space required for debris storage during an overflow event. The footprint will also work if the width and length dimensions are interchanged. Attached you will also find the general information for both the ACU-SCREEN fine overflow screens and the ACU-BEND underflow bending weirs.

For the four sites, we have made the following selections:

SITE # 17: Design Flow (Qd) = 19 cfs; Existing Structure; Access Width = 30 to 40 ft; Influent Pipe = 42"Ø; One way check flap required; Existing Chamber = 10' x 10'; The Overflow Weir Sill Elevation is assumed to be = 0.00 ft.; The debris will be directed to the dry weather flow at this site.

- Equipment selected for this site is: One (1) ACU-SCREEN fine screen model GAS-DHS-183 and one (1) ACU-BEND underflow bending weir model GAB-60/183/4. The bending weir, which is sealed on all four sides, will serve two functions. The first is to insure that the available upstream storage is fully utilized and that the upstream water level (USWL) is maintained relatively constant before any overflow event occurs and the second is to act as a backflow preventor in the case of a high downstream water level (DSWL). The screen selected for this site is a diagonal unit with a single 6' screening module driven by an hydraulic power unit with a control panel and water level measuring device. The bending weir is of the underflow type, sealed on four sides, with integral counterweights, a height of 2 ft and a length of 6 ft.
- The required footprint to accommodate this equipment is 8.5' wide x 10' long.
- The ACU-SCREEN / ACU-BEND combination will operate so that the USWL will vary from +1.90 to +2.05 ft for all flows varying from 0 to Qd (19 cfs).
- If the screen is 40 % blocked, then the USWL will rise to +2.25 ft at Qd.
- With the screen operating under normal conditions (no blockage), the screen will have a maximum capacity of 35 cfs before overtopping at elevation +2.30 ft (top of screen).
- If the screen is completely blocked, then the top of the screen will act as an emergency overflow. The depth of water over the top of the screen will be 0.77 ft or elevation +3.07 ft.
- The budget price for this equipment (GAS-DHS-183 & GAB-60/183/4) is \$ 60,400 US Funds (includes ACU BEND).

SITE # 21: Design Flow (Qd) = 22 cfs; New Structure; Influent Pipe = 66"Ø; The Overflow Weir Sill Elevation is assumed to be = 0.00 ft.; The debris will require a macerating pump at this site to return it to the dry weather flow.

- Equipment selected for this site is: One (1) ACU-SCREEN fine screen model GAS-HWS-168, water wheel driven. The screen selected for this site is a horizontal unit with a single 5.5' screening module driven by a water wheel. The water wheel requires a 2 ft differential between the crest of the overflow weir and the maximum DSWL.
- The required footprint to accommodate this equipment is 8' wide x 8' long.
- The ACU-SCREEN will operate so that the USWL will vary from +0.00 to +1.21 ft for all flows varying from 0 to Qd (22 cfs).
- If the screen is 40 % blocked, then the USWL will rise to 1.90 ft at Qd.
- With the screen operating under normal conditions (no blockage), the screen will have a maximum capacity of 38 cfs before overtopping at elevation 2.00 ft (top of screen).
- If the screen is completely blocked, then the top of the screen will act as an emergency overflow. The depth of water over the top of the screen will be 0.88 ft or elevation +2.88 ft.

- The budget price for this equipment (GAS-HWS-168) is \$ 46,400 US Funds + \$14,000 for ACU BEND.

SITE # 26: Design Flow (Qd) = 72 cfs; New Structure; Influent Pipe = 72" & 84"ø; The Overflow Weir Sill Elevation is assumed to be = 0.00 ft.; The debris will be directed to the existing adjacent pump station at this site.

- Equipment selected for this site is: One (1) ACU-SCREEN fine screen model GAS-HWD-500. The screen selected for this site is a horizontal unit with two 8.2' screening modules driven by a water wheel. The water wheel requires a 2 ft differential between the crest of the overflow weir and the maximum DSWL.
- The required footprint to accommodate this equipment is 20' wide x 10' long.
- The ACU-SCREEN will operate so that the USWL will vary from +0.00 to +1.31 ft for all flows varying from 0 to Qd (72 cfs).
- If the screen is 40 % blocked, then the USWL will rise to +2.13 ft at Qd.
- With the screen operating under normal conditions (no blockage), the screen will have a maximum capacity of 127 cfs before overtopping at elevation +2.30 ft (top of screen).
- If the screen is completely blocked, then the top of the screen will act as an emergency overflow. The depth of water over the top of the screen will be 1.05 ft or elevation +3.35 ft.
- The budget price for this equipment (GAS-HWD-500) is \$ 65,000 US Funds + \$25,000 for ACU BEND.

SITE # 52: Design Flow (Qd) = 8 cfs; New Structure; Influent Pipe = 48"ø; The Overflow Weir Sill Elevation is assumed to be = 0.00 ft.; The debris will be pumped to the dry weather flow at a site approximately 100 ft away.

- Equipment selected for this site is: One (1) ACU-SCREEN fine screen model GAS-HWS-107. The screen selected for this site is a horizontal unit with a single 3.5' screening module driven by a water wheel. The water wheel requires a 2 ft differential between the crest of the overflow weir and the maximum DSWL.
- The required footprint to accommodate this equipment is 6' wide x 8' long.
- The ACU-SCREEN will operate so that the USWL will vary from +0.00 to +0.85 ft for all flows varying from 0 to Qd (8 cfs).
- If the screen is 40 % blocked, then the USWL will rise to +1.15 ft at Qd.
- With the screen operating under normal conditions (no blockage), the screen will have a maximum capacity of 15.9 cfs before overtopping at elevation +1.30 ft (top of screen).
- If the screen is completely blocked, then the top of the screen will act as an emergency overflow. The depth of water over the top of the screen will be 0.54 ft or elevation +1.84 ft.
- The budget price for this equipment (GAS-HWS-107) is \$ 44,500 US Funds + \$10,000 for ACU BEND.

Please note that the budget prices include the equipment, all gaskets and seals, anchoring system, crating, shipping, O&M manuals, installation assistance, start-up and operator training. The budget prices also include an amount for the two sites requiring pumping of the debris back to the dry weather flow location. The civil costs and installation is not included in our prices.

When you have more information on these sites, we will be pleased to work with you to develop detailed site drawings.

Should you have any questions or comments, do not hesitate to contact me. However, please note that I will be out of the office from September 20 16:00 hours to September 29, 2004. Please speak to Steve Bigelow or leave a message for me during this period.

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## ACU-BEND Selection Criteria:

### Design Data:

Weir Overflow Capacity (Qd): \_\_\_\_\_ (indicate L/s, cfs, gpm, etc...)  
Maximum Head (H) at Qd: \_\_\_\_\_ (indicate ft or m)  
Existing Structure: \_\_\_\_\_ (yes/no)  
Overflow Weir Elevation: \_\_\_\_\_  
Overflow Weir Length: \_\_\_\_\_  
Maximum Upstream Water Level  
(Max USWL): \_\_\_\_\_  
Preferred number of Weir Modules: \_\_\_\_\_  
Sealed on all Four Sides: \_\_\_\_\_ (yes/no)

### Preferred Counterweight Option:

Concrete Weights: \_\_\_\_\_  
Galvanized Steel Weights: \_\_\_\_\_  
Stainless Steel Weights: \_\_\_\_\_

### Material of Construction Preference:

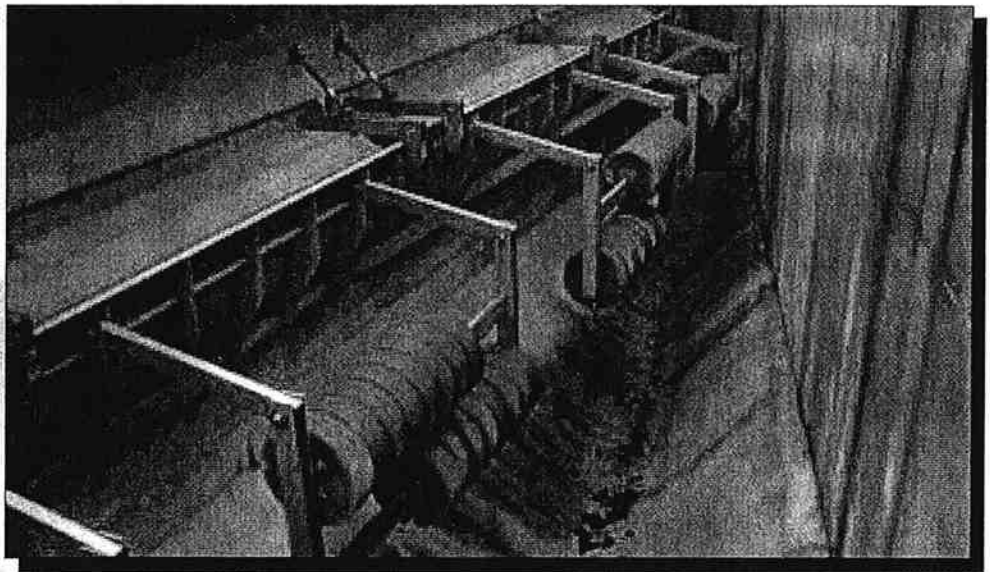
SS 304: \_\_\_\_\_  
SS 316: \_\_\_\_\_

### Weir Monitoring Option:

Discharge Monitoring: \_\_\_\_\_ (yes/no)  
Installation Assistance Required: \_\_\_\_\_ (yes/no)  
Start-Up Required: \_\_\_\_\_ (yes/no)  
Personnel Training Required: \_\_\_\_\_ (yes/no)

## ACU-BEND Bending Weir Type "U"

The  
Clear  
Solution



### Application

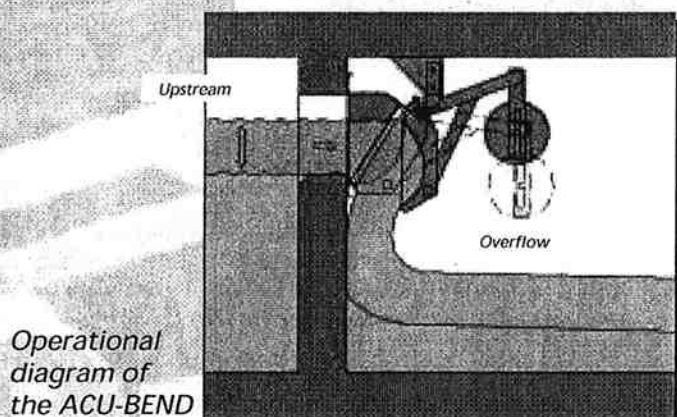
Once a combined sewer overflow (CSO) tank (or sewer) or a stormwater overflow tank (or sewer) is full, any additional influent water must be able to reach the receiving stream. In the past this was usually accomplished with the use of fixed weirs. However fixed weirs have inherent disadvantages including: increased water pollution, lower usable tank and sewer storage volumes and no backflow protection. To avoid the disadvantages of fixed weirs increasing use is made of overflow bending weirs such as the unique and patented **ACU-BEND**.

The **ACU-BEND** is designed to ensure that a constant maximum storage level is maintained upstream of the weir so that full utilization is made of all the available upstream storage volume. The **ACU-BEND** is designed to open just enough to allow the additional influent water to overflow the weir while maintaining the upstream water level. This ensures that the frequency of overflow events is reduced which results in reducing the discharge of highly polluted water to the receiving stream.

The entire overflow weir length can be utilized for overflow level control. The compact design makes the system particularly suitable for structures with limited space and for installation in existing structures. The special weir construction makes virtually constant maximum storage levels possible, even under backflow conditions.

### Features

- Lower storage tank construction costs owing to smaller tank volumes (the **ACU-BEND** allows for 100 % utilization of storage tank volume as opposed to only 70 to 80% for conventional weirs).
- Increased water pollution protection since discharge from the storage tank to receiving stream commences only after complete filling of the available storage volume or after reaching maximum storage level.
- Stainless steel 316 construction ensures reliable trouble free operation.
- The maximum storage level setting may be easily modified after installation of the device.
- Hydraulically ideal shape of the weir flap ensures blockage free discharge
- Integrated counterweight design eliminates need for separate counterweight chamber.
- Easy retrofitting of existing basin overflows possible (additional storage volume gain).
- The **ACU-BEND** is available with seals on all four sides, so that it can act as a backflow prevention device for flood protection.



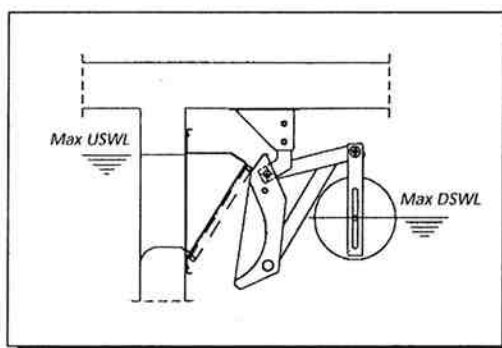
## Operation

The **ACU-BEND** is installed on the existing fixed overflow weir, with its pivot points attached to the structure's ceiling, sidewall or crossbeam. The pivot balances the forces produced by the hydrodynamic loading on the overflow weir flap with those of the counterweight. This ensures equilibrium in any weir position, resulting in a highly sensitive response to the slightest change in the upstream water level. The **ACU-BEND** remains in the rest position (closed) until the maximum design storage level is reached. Upon reaching this level, the **ACU-BEND** immediately responds and swings away from the sill, allowing the excess water to overflow while maintaining a constant upstream water level.

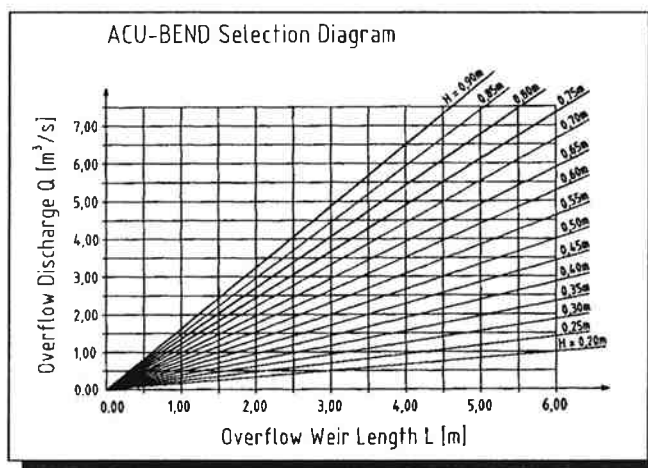
The patented special shape of the weir body and the arrangement of the hinged flap and counterweights are the result of extensive calculations and hydraulic testing. The relationship between the static and dynamic hydraulic forces, as well as the passive forces of the counterweights (and weir), have been optimized. This results in a high discharge coefficient for the **ACU-BEND** which ensures that a constant upstream water level is maintained without negatively impacting the upstream hydraulic grade line.

If required, the maximum storage level setting may be adjusted on site by removing or adding counterweights.

## ACU-BEND Installation



## Selection diagram



The calculation of the overflow discharge  $Q$  is based on the Poleni weir formula

$$Q = \frac{2}{3} \cdot \mu \cdot L \cdot H^{1.5} \cdot \sqrt{2 \cdot g}$$

The overflow coefficient  $\mu = 0,64$

According to the Poleni formula, the hydraulic capacity of the **ACU-BEND** is at least equal to that of a standard overflow weir. This means that the upstream water level is not adversely affected by the presence of the **ACU-BEND** overflow bending weir type U.

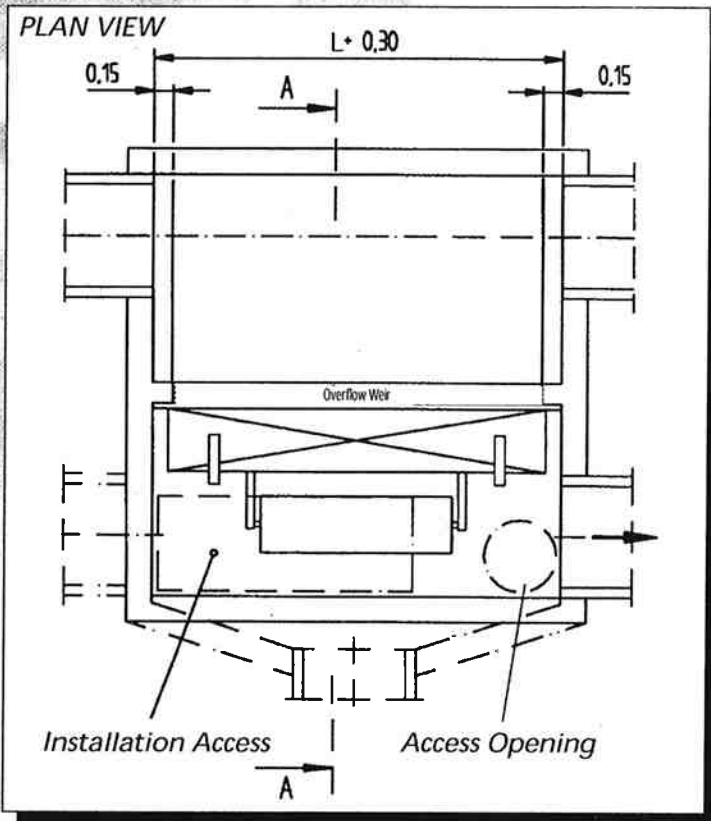
Overflow weir sizes not shown or beyond the diagram limits may be obtained by special request.

Represented locally by:

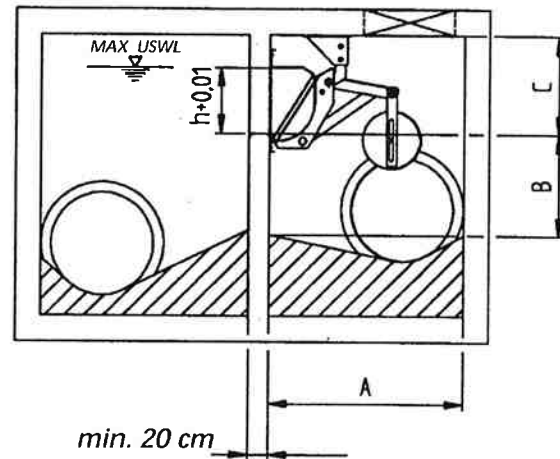
## Installation Data for ACU-BEND Weir

Backflow protection design (sealed on four sides)

Detailed installation drawings will be prepared by GWMS for specific project application



Section A - A



Installation and anchoring on ceiling, crossbeam or sidewalls are optional, depending on site constraints

If a floatables baffle wall is to be installed upstream of the ACU-BEND, insure adequate clearance of approximately  $1.5 \times h$  between the baffle and the overflow weir.

### Dimensions:

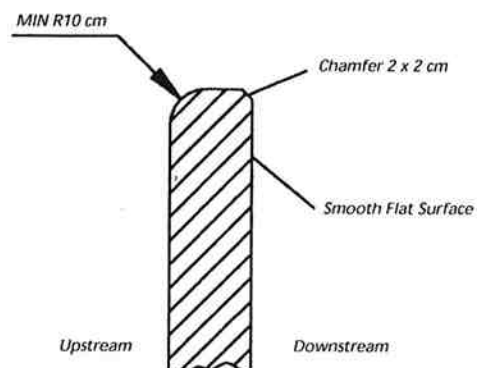
h [m]	0.20 - 0.30	0.30 - 0.40	0.40 - 0.50	0.50 - 0.60	0.60 - 0.70	0.70 - 0.80	0.80 - 0.90
L [m]	up to 10.00						
A [m]	$\geq 0.85$	$\geq 1.00$	$\geq 1.20$	$\geq 1.40$	$\geq 1.60$	$\geq 1.85$	$\geq 2.20$
B [m]	$\geq 0.30$	$\geq 0.38$	$\geq 0.46$	$\geq 0.53$	$\geq 0.63$	$\geq 0.70$	$\geq 0.80$
C [m]	$\geq 0.50$	$\geq 0.60$	$\geq 0.70$	$\geq 0.80$	$\geq 0.90$	$\geq 1.10$	$\geq 1.30$

Other dimensions available upon request

Install secondary concrete only after overflow weir installation is complete.

Size of installation opening depends on specific project requirements and site constraints as well as ACU-BEND dimensions.

### Recommended Shape of Overflow Weir



## ACU-SCREEN Selection Criteria:

### Design Data:

Screen Overflow Capacity (Qd): \_\_\_\_\_ (indicate L/s, cfs, gpm, etc...)  
 Maximum Head (H) at Qd: \_\_\_\_\_ (indicate ft or m)  
 Existing Structure: \_\_\_\_\_ (yes/no)  
 Overflow Weir Elevation: \_\_\_\_\_ Overflow Weir Length: \_\_\_\_\_  
 Maximum Upstream Water Level (Max USWL): \_\_\_\_\_  
 Preferred number of Screening Modules: \_\_\_\_\_

### Preferred Drive Option:

Water Wheel (WW) Driven: \_\_\_\_\_ (Minimum Required Vertical  
 Downstream Clearance 24" [600 mm])  
 Hydraulic Power Unit (HPU) Driven: \_\_\_\_\_  
 Electric Motor (EM) Driven: \_\_\_\_\_  
 Note: Options other than water wheel driven will require a control panel with water level sensor.

### Control Panel (Required for HPU Driven Screen):

Enclosure Type: \_\_\_\_\_ (NEMA 12, 4 or 4X)  
 CP Location: \_\_\_\_\_ (Non-hazardous, Ex-Proof, etc...)  
 Panel Voltage Requirements: \_\_\_\_\_ (VAC, ph, 60 Hz)  
 Hydraulic Pump Motor Voltage: \_\_\_\_\_ (VAC, ph, 60 Hz)  
 Distance between HPU and ACU-SCREEN: \_\_\_\_\_  
 Space required for the control panel enclosure is approximately: 24" x 36" x 16" (w x h x d) for up to 2 modules  
 30" x 48" x 16" (w x h x d) for up to 4 modules

Standard Hydraulic Power Unit Components: -High Oil Pressure, Low Oil Level and High Oil Temperature Alarms & Corresponding Gauges; -  
 Breather Cap; -Uses biodegradable hydraulic oil (water pollution class 1); -Manual or Automatic  
 operation; -Automatic reversal in case of blockage

### Control Panel (Required for EM Driven Screen):

Enclosure Type: \_\_\_\_\_ (NEMA 12, 4 or 4X)  
 Panel Voltage Requirements: \_\_\_\_\_ (VAC, ph, 60 Hz)  
 Screen Motor Voltage: \_\_\_\_\_ (VAC, ph, 60 Hz)  
 Control Panel Location: \_\_\_\_\_ (Non-hazardous, Ex-Proof, etc...)  
 Space required for the control panel enclosure is approximately: 24" x 24" x 10" (w x h x d)

### Control Panel Options:

Upstream Water Level Sensor Type: \_\_\_\_\_ (Float or Ultrasonic)  
 Menu-driven display with relevant operating data: \_\_\_\_\_ (yes/no)  
 Dry contacts for remote monitoring: \_\_\_\_\_ (yes/no)  
 Length of Hydraulic Hoses Required: \_\_\_\_\_ (ft or m)  
 Installation Assistance Required: \_\_\_\_\_ (yes/no)  
 Start-Up Required: \_\_\_\_\_ (yes/no)  
 Personnel Training Required: \_\_\_\_\_ (yes/no)

## ACU-SCREEN Fine Slotted Overflow Screen

The  
Clear  
Solution



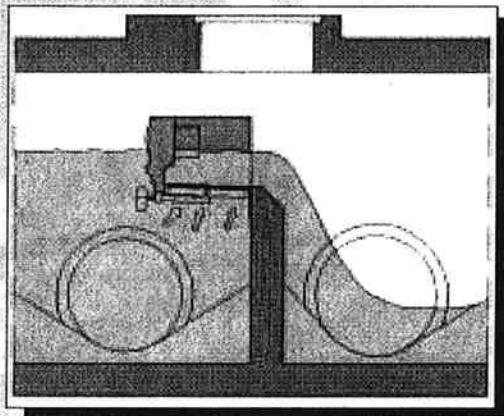
### Application

Stormwater discharge systems and combined sewer overflows (CSO) are the weak points in sewer systems, usually at the expense of water pollution prevention. They are entry points through which urban pollutants reach the receiving stream. In the past, there were frequently no adequate preventive measures available or in place. Today however, there are legal requirements in many areas for the retention of floating and suspended matter in stormwater and combined sewer overflow systems. The **ACU-SCREEN** economically provides effective receiving stream protection. It is designed to be installed over stormwater discharge sills, settling tank overflow weirs, CSO weirs, flood discharge systems, etc... Its modular design makes it suitable for any type of overflow system and is easily retro-fitted to existing structures.

The **ACU-SCREEN** design is based on a special stainless steel screening surface, with slotted screen openings of 3/16" x 1" and a total free area of 50 %, achieving the highest possible degree of solids retention while minimizing the head loss.

### Features:

- The **ACU-SCREEN** is constructed entirely of stainless steel 316 ensuring reliable trouble free operation.
- Self adjusting brush provides automatic cleaning of screening surface in both directions.
- The **ACU-SCREEN** cleaning system may be driven by a water wheel (requiring no external energy) or by an electro-hydraulic drive, depending on site constraints.
- Slotted screening surface ensures the retention of all solids greater than 3/16".
- Design of cleaning system mechanism ensures that moving parts are never submerged.
- Modular design allows for installation over virtually any overflow weir type and size.
- Easy to retrofit into existing structures.
- May be installed in the vertical or diagonal position when the preferred horizontal arrangement is not possible due to site constraints.



Operating diagram for the **ACU-SCREEN** with electro-hydraulic drive.

## Operation

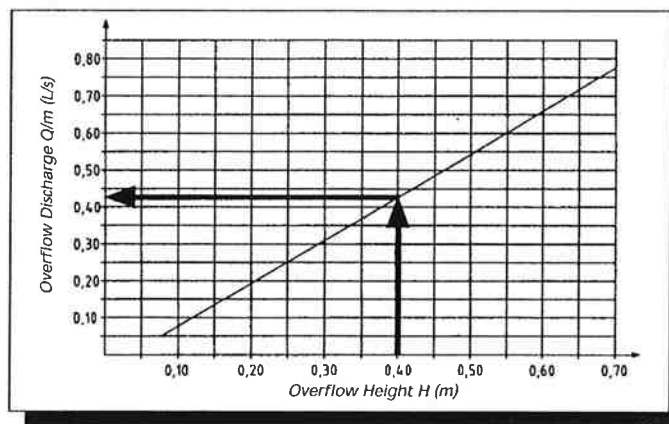
The **ACU-SCREEN** screening surface is made up of a series of 3/16"x1" slots and has a clear opening of 50%. During an overflow event, the solids retained by the screen are continuously cleaned by the back and forth movement of the cleaning brush. The preferred installation is horizontal, however it may also be installed vertically or diagonally to satisfy any existing structural constraints.

The **ACU-SCREEN** can be driven without the need for external energy as the cleaning mechanism may be powered by the proven principle of the water wheel. The water wheel powers a gear drive which converts this energy into an oscillatory motion. A weighted, self-adjusting brush, attached to the guide carriage, is driven back and forth across the screening surface, pushing all retained solids into storage areas, found at either end of the screen modules. Because the screen is continuously brushed clean, clogging of the screening surface cannot occur. The retained solids are discharged into the sewage stream at the end of an overflow event and carried to the sewage treatment plant for removal.

The **ACU-SCREEN** may also be equipped with an electro-hydraulic drive (where site constraints warrant), whose electronic components are located well outside the overflow structure. Only biodegradable hydraulic oils are used.

The **ACU-SCREEN** may be installed in combination with an **ACU-BEND** bending weir to maximize the use of all available upstream in-situ storage and to minimize the frequency of an overflow event.

Represented locally by:



Example:

Determining the required screening surface length (standard screen width of 0.70 m).

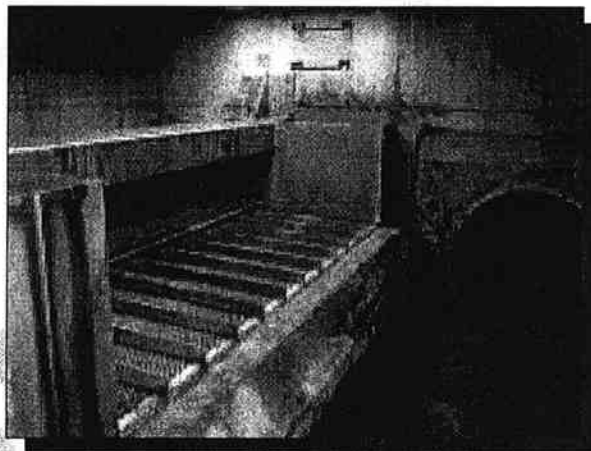
Design overflow discharge	$Q = 1500 \text{ L/s (53 cfs)}$
Maximum overflow height	$H = 0.40 \text{ m (16")}$

From selection diagram:

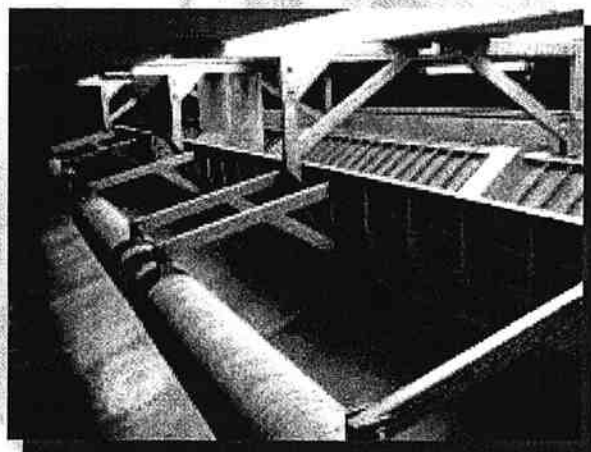
Flow per meter ( $Q/m$ ) of overflow length is 430 L/s

$\Rightarrow$  Screen Length ( $L$ ) =  $Q \div Q/m = 1500 / 430 = 3.49 \text{ m}$

**Selected: Min. screen module length ( $L$ ) 3.50 m (11.5')**



**ACU-SCREEN** in stormwater overflow basin.

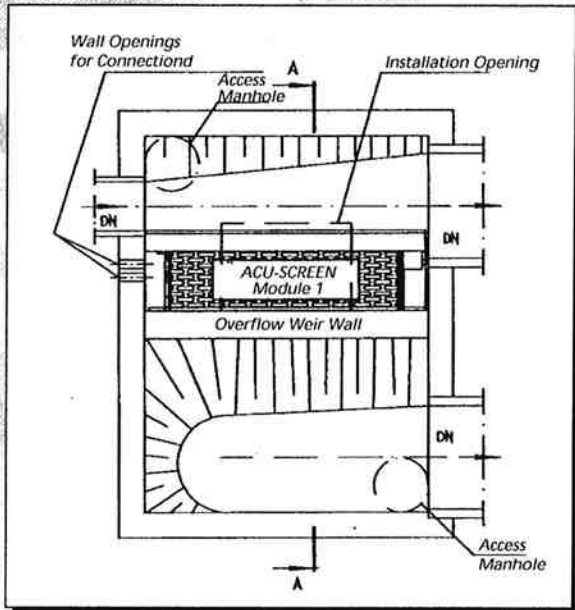


**ACU-SCREEN** with **ACU-BEND** combination.

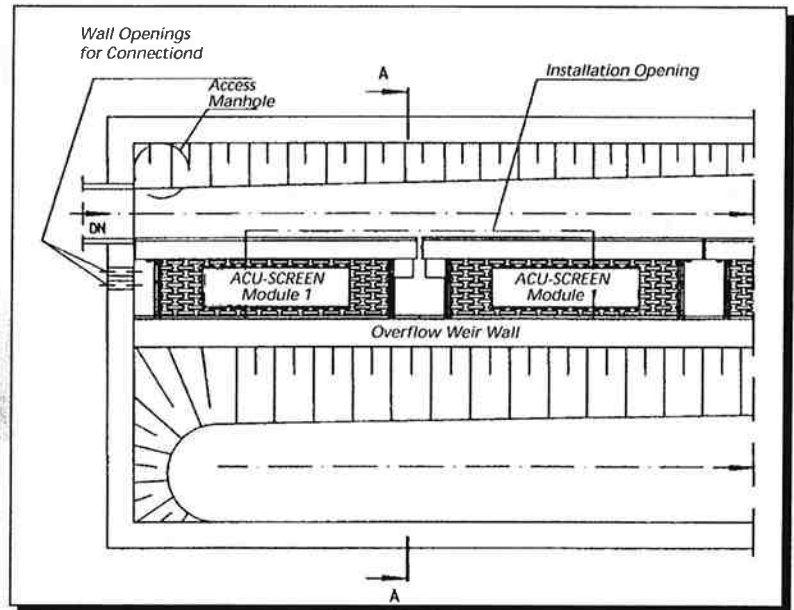
Detailed installation drawings will be prepared by GWMS for specific project application

## Sample Installations for the ACU-SCREEN

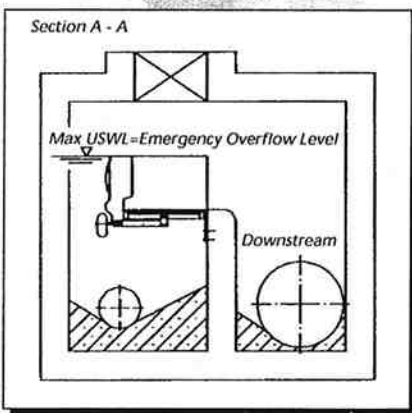
Horizontal Arrangement  
With one module



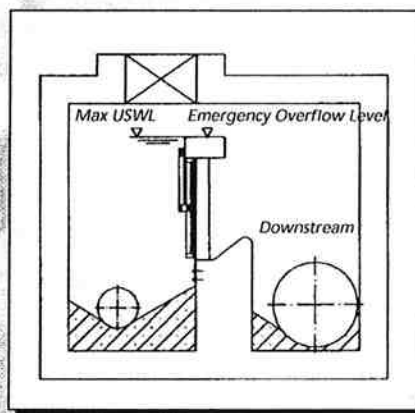
Horizontal arrangement  
with 2 or more modules



Horizontal arrangement



Vertical arrangement



Horizontal arrangement  
(water wheel driven)

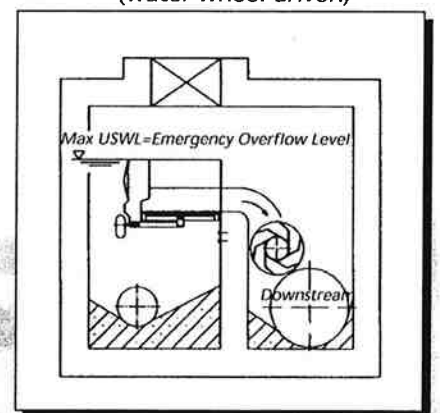
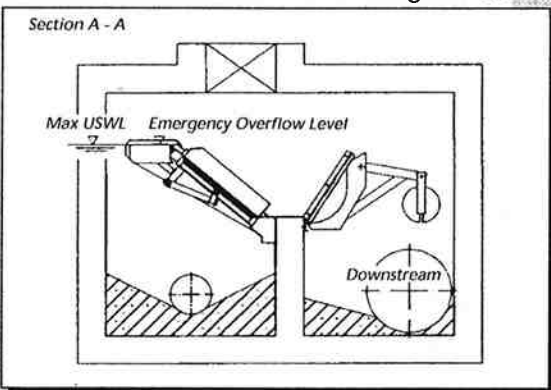
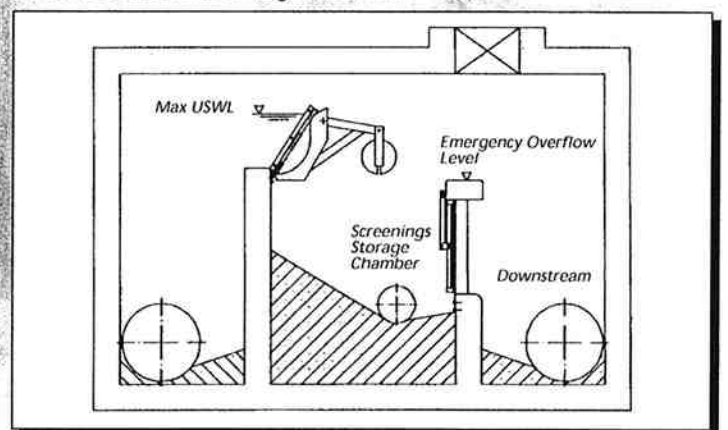


Diagram arrangement in combination  
with an ACU-BEND overflow bending weir H



Vertical arrangement with auxiliary sill and  
screened material storage chamber



September 20, 2004

Ms. Rita Fordiani  
CH2M Hill  
Boston, MA  
Tel: 978-443-9218  
rfordian@ch2m.comRe: ACTIFLO® Budgetary Price  
CH2M Hill-Boston

Dear Ms. Fordiani,

Thank you for your interest in the Krüger ACTIFLO® process for Combined Sewer Overflow treatment. Enclosed is our price estimate, design summary, layout, and equipment scope of supply for a 1 x 14 MGD ACTIFLO® system. Also enclosed are the layout drawings, price estimates and operating cost estimates for three additional designs: 5 MGD, 12 MGD and 48 MGD (2 x 24 MGD).

Please note that the raw water entering the 12, 14 or 48 MGD ACTIFLO® systems must have particles greater than 10 mm in size removed by means of mechanical fine screening. The 1 x 5 MGD system must have particles greater than 6 mm removed. Additionally, proper dispersion of the coagulant must be achieved through static or induction mixing prior to the entry of the raw water into the ACTIFLO® system.

The corresponding scope of supply is detailed in the following pages and summarized below:

- Mechanical equipment related to the ACTIFLO® system,
- Automatic liquid polymer preparation and dosing system,
- Coagulant metering pumps and control panel,
- ACTIFLO® system based PLC control panel,
- Process instrumentation,
- Spare parts.

Our budgetary prices for the four options are as follows:

Design Option	Site	Flow, cfs	Size	Price
Option 1	#21	22 cfs	1 x 14 MGD	<b><u>\$1,050,000.00</u></b>
Option 2	#52	8 cfs	1 x 5 MGD	<b><u>\$800,000.00</u></b>
Option 3	#17	19 cfs	1 x 12 MGD	<b><u>\$1,000,000.00</u></b>
Option 4	#26	72 cfs	2 x 24 MGD	<b><u>\$2,400,000.00</u></b>



Kruger Products  
401 Harrison Oaks Blvd.  
Ste. 100  
Cary, NC 27513

TELEPHONE 919-677-8310  
FACSIMILE 919-677-0082

These prices are valid for ninety days from the date of this proposal, are exclusive of any sales or use taxes, and are subject to Krüger Standard Terms and Conditions of Sale.

The above prices also include the following:

- Freight to the job site (FOB shipping points),
- O&M manuals,
- Support in process engineering,
- Advice during construction and installation,
- Start-up assistance,
- Operator training,
- One year warranty.

The terms of payments are 15% on submittal of shop drawings, 75% on the delivery of equipment to the site and the final 10% on start-up of the system not to exceed 120 days from delivery of equipment.

Payment shall not be contingent upon receipt of funds by the Contractor from the Owner. All other terms per our standard conditions of sale are attached. Payment terms are net 30 days from the aforementioned benchmarks.

The schedule of delivery shall be as follows:

- Shop drawings will be submitted within 6-8 weeks of receipt of an executed contract by all parties.
- All equipment will be delivered within 16-18 weeks after receipt of approved shop drawings. Approval must be in the written form.
- Installation manuals will be furnished upon delivery of the equipment.
- Operation and Maintenance Manuals will be submitted within 90 days after receipt of approved shop drawings

If you have any questions or require any additional information please do not hesitate to contact our local representative, Bruce Stevens at (207) 395-4554, or call me directly at 919-677-8310.

Sincerely,

David Holliman  
Process Engineer  
ACTIFLO® Systems

cc. Will Sullivan, Andy Szekeress, Erica Latker (Krüger)  
Bruce Stevens (F.R. Mahony & Associates)

**ACTIFLO®**  
**Budgetary Price Package**  
**for**  
**CH2M Hill-Boston**  
**Site # 21**

**1 x 14 MGD**

**Krüger, Inc. Project: #**

**I. Krüger, Inc.**  
**401 Harrison Oaks Blvd; Suite 100**  
**Cary, NC 27513**  
**Phone (919) 677-8310**  
**Fax (919) 677-0082**



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1. Pricing, Terms, and Schedule
2. Krüger, Inc. Standard Terms of Sale
3. Design Summary
4. Layout Drawings (4 Designs)
5. ACTIFLO® Equipment Scope of Supply
6. Krüger, Inc. Scope of Work
7. Contractor Scope of Work
8. ACTIFLO® Operating Costs (4 Designs)



## **SECTION ONE**

### **Pricing, Terms, and Schedule**



## **PRICING, TERMS AND SCHEDULE**

### **Price**

The prices for the ACTIFLO® Systems, as defined in the following pages, including process and design engineering, field services and equipment are:

Option 1: 1 x 14 MGD	<b><u>\$1,050,000.00</u></b>
Option 2: 1 x 5 MGD	<b><u>\$800,000.00</u></b>
Option 3: 1 x 12 MGD	<b><u>\$1,000,000.00</u></b>
Option 4: 2 x 24 MGD	<b><u>\$2,400,000.00</u></b>

These prices are subject to I. Krüger, Inc. Standard Terms of Sale.

These prices are FOB shipping points, with freight allowed to the job site. These prices do not include any sales or use taxes. In addition, these prices are valid for ninety days from the date of issue and are subject to negotiation of a mutually acceptable contract.

### **Terms of Payment**

The terms of payment are as follows:

1. 15% on submittal of shop drawings
2. 75% on the delivery of equipment to the site
3. Final 10% on start-up of the system not to exceed 120 days from delivery of equipment

Notes: Payment shall not be contingent upon receipt of funds by the Contractor from the Owner. There shall be no retention in payments due to Krüger, Inc. All other terms per our Standard Terms of Sale are attached.

All payment terms are net 30 days from the date of invoice.

### **Schedule**

- Shop drawings will be submitted within 6-8 weeks of receipt of an executed contract by all parties.
- All equipment will be delivered within 16-18 weeks after receipt of written approval of the shop drawings.
- Installation manuals will be furnished per Specification.
- Operation and Maintenance Manuals will be submitted within 90 days after receipt of approved shop drawings.



## **SECTION TWO**

### **I. Krüger, Inc. Standard Terms of Sale**



**I. KRÜGER INC.**  
**STANDARD TERMS OF SALE**

1. Applicable Terms. These terms govern the purchase and sale of the equipment and related services, if any (collectively, "Equipment"), referred to in Seller's purchase order, quotation, proposal or acknowledgment, as the case may be ("Seller's Documentation"). Whether these terms are included in an offer or an acceptance by Seller, such offer or acceptance is conditioned on Buyer's assent to these terms. Seller rejects all additional or different terms in any of Buyer's forms or documents.
2. Payment. Buyer shall pay Seller the full purchase price as set forth in Seller's Documentation. Unless Seller's Documentation provides otherwise, freight, storage, insurance and all taxes, duties or other governmental charges relating to the Equipment shall be paid by Buyer. If Seller is required to pay any such charges, Buyer shall immediately reimburse Seller. All payments are due within 30 days after receipt of invoice. Buyer shall be charged the lower of 1 ½% interest per month or the maximum legal rate on all amounts not received by the due date and shall pay all of Seller's reasonable costs (including attorneys' fees) of collecting amounts due but unpaid. All orders are subject to credit approval.
3. Delivery. Delivery of the Equipment shall be in material compliance with the schedule in Seller's Documentation. Unless Seller's Documentation provides otherwise, Delivery terms are F.O.B. Seller's facility.
4. Ownership of Materials. All devices, designs (including drawings, plans and specifications), estimates, prices, notes, electronic data and other documents or information prepared or disclosed by Seller, and all related intellectual property rights, shall remain Seller's property. Seller grants Buyer a non-exclusive, non-transferable license to use any such material solely for Buyer's use of the Equipment. Buyer shall not disclose any such material to third parties without Seller's prior written consent.
5. Changes. Seller shall not implement any changes in the scope of work described in Seller's Documentation unless Buyer and Seller agree in writing to the details of the change and any resulting price, schedule or other contractual modifications. This includes any changes necessitated by a change in applicable law occurring after the effective date of any contract including these terms.
6. Warranty. Subject to the following sentence, Seller warrants to Buyer that the Equipment shall materially conform to the description in Seller's Documentation and shall be free from defects in material and workmanship. The foregoing warranty shall not apply to any Equipment that is specified or otherwise demanded by Buyer and is not manufactured or selected by Seller, as to which (i) Seller hereby assigns to Buyer, to the extent assignable, any warranties made to Seller and (ii) Seller shall have no other liability to Buyer under warranty, tort or any other legal theory. If Buyer gives Seller prompt written notice of breach of this warranty within 18 months from delivery or 1 year from acceptance, whichever occurs first (the "Warranty Period"), Seller shall, at its sole option and as Buyer's sole remedy, repair or replace the subject parts or refund the purchase price therefore. If Seller determines that any claimed breach is not, in fact, covered by this warranty, Buyer shall pay Seller its then customary charges for any repair or replacement made by Seller. Seller's warranty is conditioned on Buyer's (a) operating and maintaining the Equipment in accordance with Seller's instructions, (b) not making any unauthorized repairs or alterations, and (c) not being in default of any payment obligation to Seller. Seller's warranty does not cover damage caused by chemical action or abrasive material, misuse or improper installation (unless installed by Seller). THE WARRANTIES SET FORTH IN THIS SECTION ARE SELLER'S SOLE AND EXCLUSIVE WARRANTIES AND ARE SUBJECT TO SECTION 10 BELOW. SELLER MAKES NO OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PURPOSE.
7. Indemnity. Seller shall indemnify, defend and hold Buyer harmless from any claim, cause of action or liability incurred by Buyer as a result of third party claims for personal injury, death or damage to tangible property, to the extent caused by Seller's negligence. Seller shall have the sole authority to direct the defense of and settle any indemnified claim. Seller's indemnification is conditioned on Buyer (a) promptly, within the Warranty Period, notifying Seller of any claim, and (b) providing reasonable cooperation in the defense of any claim.
8. Force Majeure. Neither Seller nor Buyer shall have any liability for any breach (except for breach of payment obligations) caused by extreme weather or other act of God, strike or other labor shortage or disturbance, fire, accident, war or civil disturbance, delay of carriers, failure of normal sources of supply, act of government or any other cause beyond such party's reasonable control.

9. Cancellation. If Buyer cancels or suspends its order for any reason other than Seller's breach, Buyer shall promptly pay Seller for work performed prior to cancellation or suspension and any other direct costs incurred by Seller as a result of such cancellation or suspension.

10. LIMITATION OF LIABILITY. NOTWITHSTANDING ANYTHING ELSE TO THE CONTRARY, SELLER SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR OTHER INDIRECT DAMAGES, AND SELLER'S TOTAL LIABILITY ARISING AT ANY TIME FROM THE SALE OR USE OF THE EQUIPMENT SHALL NOT EXCEED THE PURCHASE PRICE PAID FOR THE EQUIPMENT. THESE LIMITATIONS APPLY WHETHER THE LIABILITY IS BASED ON CONTRACT, TORT, STRICT LIABILITY OR ANY OTHER THEORY.

11. Miscellaneous. If these terms are issued in connection with a government contract, they shall be deemed to include those federal acquisition regulations that are required by law to be included. These terms, together with any quotation, purchase order or acknowledgement issued or signed by the Seller, comprise the complete and exclusive statement of the agreement between the parties (the "Agreement") and supersede any terms contained in Buyer's documents, unless separately signed by Seller. No part of the Agreement may be changed or cancelled except by a written document signed by Seller and Buyer. No course of dealing or performance, usage of trade or failure to enforce any term shall be used to modify the Agreement. If any of these terms is unenforceable, such term shall be limited only to the extent necessary to make it enforceable, and all other terms shall remain in full force and effect. Buyer may not assign or permit any other transfer of the Agreement without Seller's prior written consent. The Agreement shall be governed by the laws of the State of North Carolina without regard to its conflict of laws provisions.

## **SECTION THREE**

### **Design Summary**



<b>1 x 14 MGD ACTIFLO® Design</b>	
<b>Design Capacity</b>	
Total Design Flow, MGD	14
No. of Trains	1
Capacity Per Train, MGD	14
<b>Coagulation Tank Design</b>	
HRT, min	1
No. of Tanks per Train	1
Length, ft	10.7
Width, ft	8.0
Side Water Depth, ft	16
<b>Injection Tank Design</b>	
HRT, min	1
No. of Tanks per Train	1
Length, ft	10.7
Width, ft	8.1
Side Water Depth, ft	16
<b>Maturation Tank Design</b>	
HRT, min	3
No. of Tanks per Train	1
Length, ft	15.2
Width, ft	17.1
Side Water Depth, ft	16
<b>Settling Tank Design</b>	
No. of Tanks per Train	1
Length, ft	17.1
Width, ft	17.1
Side Water Depth, ft	16
Lamella Settling Area, ft <sup>2</sup>	162.45
Overflow Rate at Design Capacity, gpm/ft <sup>2</sup>	60
<b>Sand Recirculation Circuit Design</b>	
No. of Pumps per Train	2 duty + 1 stand-by
Total Dynamic Head, ft. of water	TBD
Pump Capacity, gpm	310
Number of Hydrocyclones per Pump	1
Estimated Sludge Concentration, % solids	0.1 to 0.5
Sludge Discharge per Train at Design Flow, gpm	496



## **SECTION FOUR**

### **Layout Drawings**



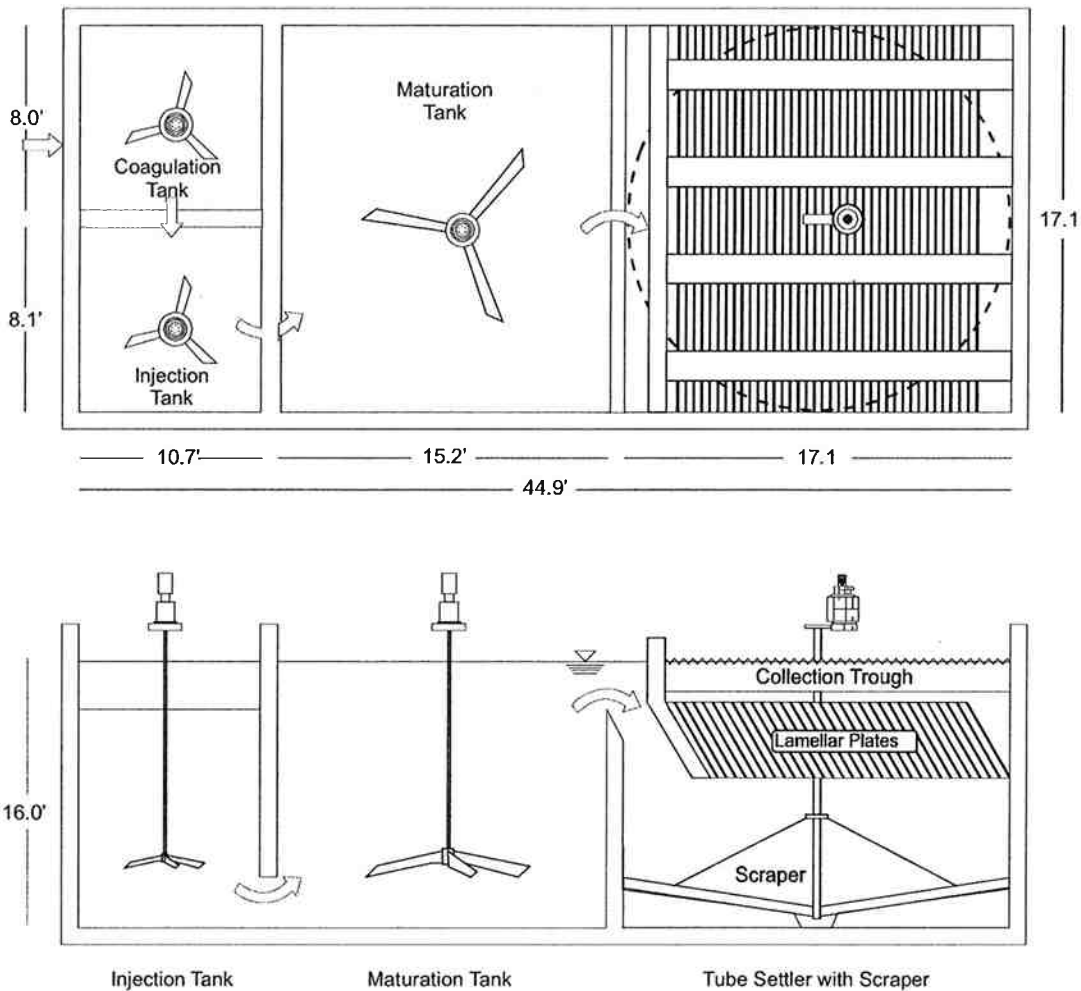
## OPTION 1

### Preliminary ACTIFLO Single Train Layout

CH2M Hill - Boston, MA - Site # 21

Total Capacity: 14 MGD

No. Of Trains: 1 x 14 MGD



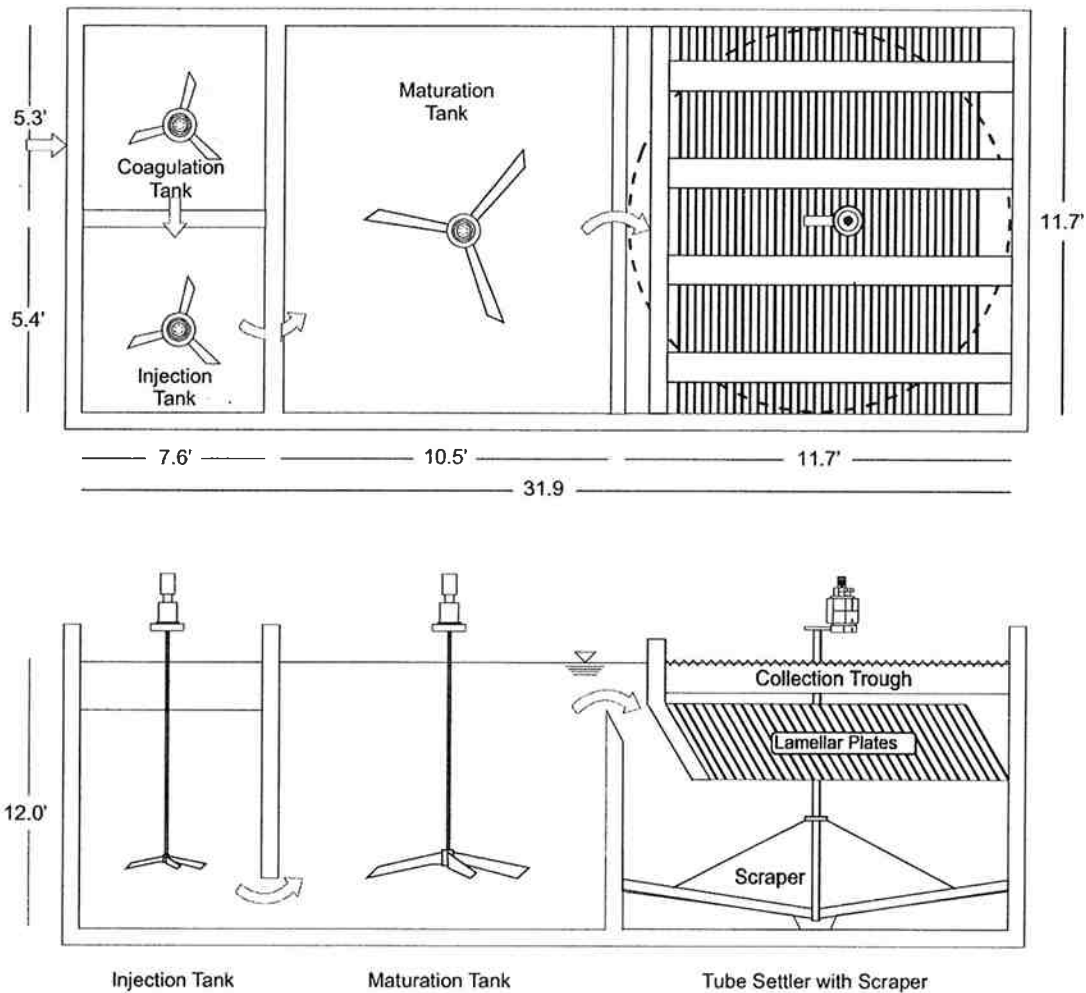
## OPTION 2

### Preliminary ACTIFLO Single Train Layout

CH2M Hill - Boston, MA - Site # 52

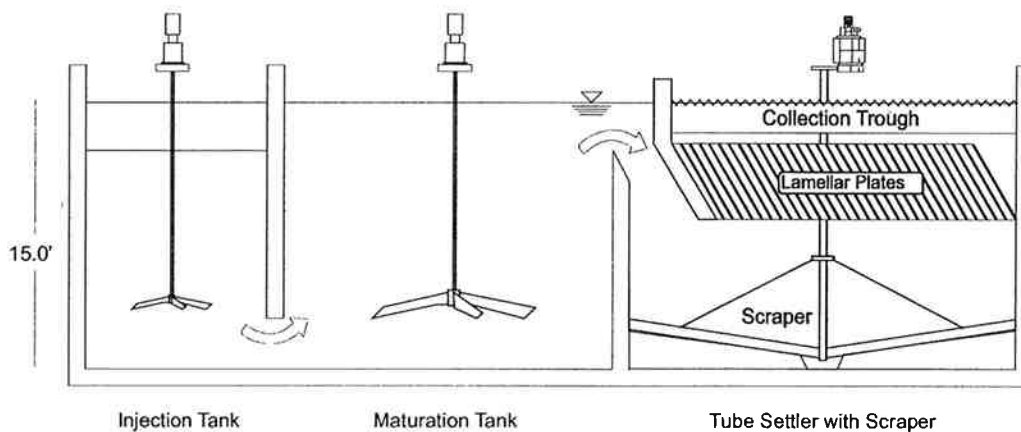
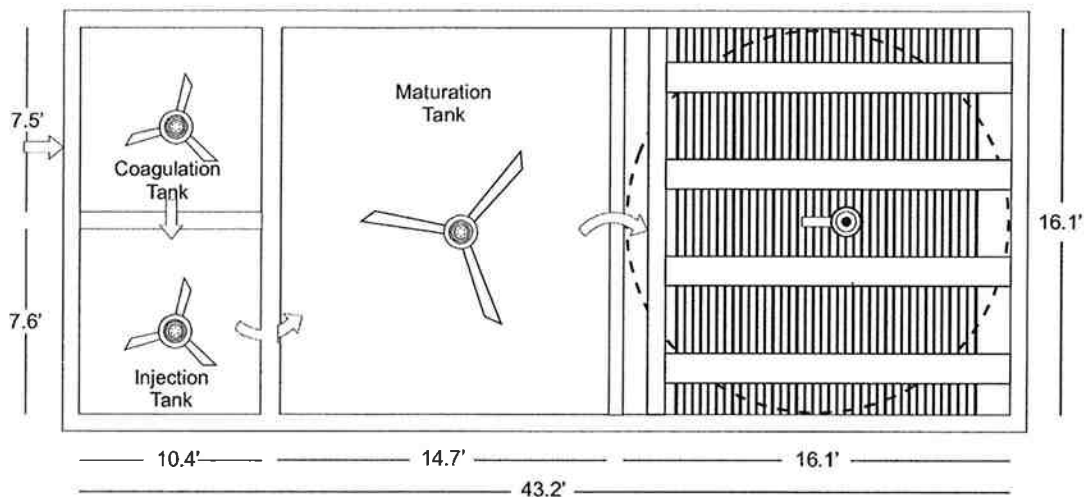
Total Capacity: 5 MGD

No. Of Trains: 1 x 5 MGD



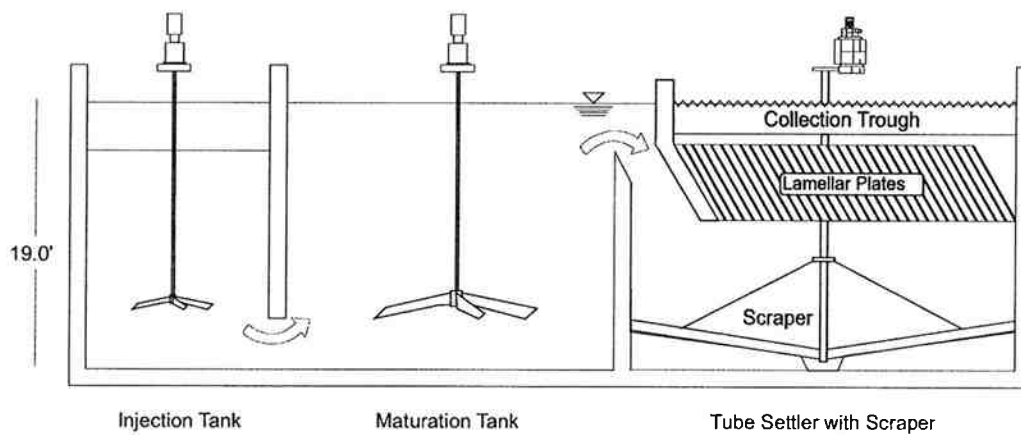
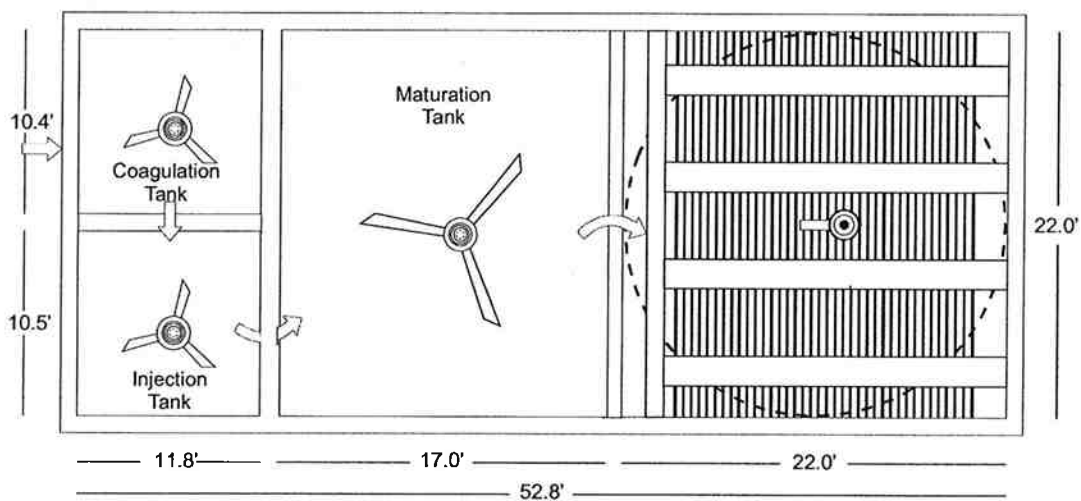
### OPTION 3

## Preliminary ACTIFLO Single Train Layout CH2M Hill - Boston, MA - Site # 17 Total Capacity: 12 MGD No. Of Trains: 1 x 12 MGD



## OPTION 4

### Preliminary ACTIFLO Single Train Layout CH2M Hill - Boston, MA - Site # 26 Total Capacity: 24 MGD No. Of Trains: 1 x 24 MGD



## **SECTION FIVE**

### **ACTIFLO® Equipment Scope of Supply**



## **ACTIFLO® Equipment Scope of Supply**

### **I. Mechanical Equipment Scope of Supply – 1 x 14 MGD**

Description	Units Per Train	Total No. of Units
<b>Coagulation Tanks</b>		
<ul style="list-style-type: none"> <li>Coagulation tank top entering mixer(s), 5 HP, TEFC, 460/3/60 motor, 304 stainless steel shaft and impellers.</li> </ul>	1	1
<b>Injection Tanks</b>		
<ul style="list-style-type: none"> <li>Injection tank top entering mixer(s), 5 HP, TEFC, 460/3/60 motor, 304 stainless steel shaft and impellers.</li> </ul>	1	1
<b>Maturation Tanks</b>		
<ul style="list-style-type: none"> <li>Maturation tank top entering mixer(s), 7.5 HP, TEFC, 460/3/60 inverter duty motor, 304 stainless steel shaft and impellers.</li> </ul>	1	1
<ul style="list-style-type: none"> <li>VFD to be supplied by others.</li> </ul>	--	By others
<ul style="list-style-type: none"> <li>Anti-Vortex Baffles, 304 stainless steel</li> </ul>	2	2
<b>Settling Tanks</b>		
<ul style="list-style-type: none"> <li>Sludge scraper assemblies, 304 stainless steel, center drive, 1.5 HP, TEFC, 460/3/60 inverter duty motor, speed reducer, complete with drive shaft, shaft protector, rake arms and blades.</li> </ul>	1	1
<ul style="list-style-type: none"> <li>VFD to be supplied by others.</li> </ul>	--	By others
<ul style="list-style-type: none"> <li>Wear plates for bottom hoppers, 304 stainless steel.</li> </ul>	1	1
<ul style="list-style-type: none"> <li>Lamella plate module sets, 304 stainless steel.</li> </ul>	1 set	1 set(s)
<ul style="list-style-type: none"> <li>Lamella plate supports, 304 stainless steel.</li> </ul>	1 set	1 set(s)
<ul style="list-style-type: none"> <li>Effluent collection troughs, 9.5' length, 1.33' width, 304 stainless steel.</li> </ul>	4	4
<ul style="list-style-type: none"> <li>Supports for collection troughs, 304 stainless steel.</li> </ul>	1 set	1 set(s)

Description	Units Per Train	Total No. of Units
<b>Microsand Recycle Circuits</b>		
<ul style="list-style-type: none"> <li>Microsand recirculation pumps, centrifugal, cast iron body, with rubber-lined volute and impeller, mechanical seal, 310 gpm capacity, 15 HP, TEFC, 460/3/60 motor with V-belt and pulley drive.</li> </ul>	2 duty + 1 stand-by	3
<ul style="list-style-type: none"> <li>Discharge side pump isolation valves, 6" diameter, eccentric plug type, manual.</li> </ul>	3	3
<ul style="list-style-type: none"> <li>Suction side pump isolation valves, 6" diameter, eccentric plug type, manual.</li> </ul>	3	3
<ul style="list-style-type: none"> <li>Flush connection valve, 1½" diameter, ball valve.</li> </ul>	3	3
<ul style="list-style-type: none"> <li>Pump discharge pressure switch assembly, complete with pressure gauge, isolation valve and diaphragm seal.</li> </ul>	3	3
<ul style="list-style-type: none"> <li>Hydrocyclones, 310 gpm capacity, urethane.</li> </ul>	2 duty + 1 stand-by	3
<ul style="list-style-type: none"> <li>Hydrocyclone pressure gauge assembly, complete with diaphragm seals and isolation valves.</li> </ul>	3	3
<ul style="list-style-type: none"> <li>Hydrocyclone underflow/overflow (sand) collection boxes, 304 stainless steel.</li> </ul>	1	1
<ul style="list-style-type: none"> <li>Hydrocyclone overflow (sludge) piping, connecting hydrocyclone overflow to overflow box.</li> </ul>	3	3
<ul style="list-style-type: none"> <li>Hydrocyclone underflow piping, PVC</li> </ul>	1	1
<ul style="list-style-type: none"> <li>Microsand for Start-up (Tons)</li> </ul>	14	14

**II. Chemical Feed Equipment – 1 x 14 MGD**

Description	Total No. of Units
<b>Automatic Liquid Polymer Processing System</b> <ul style="list-style-type: none"><li>• Liquid polymer feed/activation system, skid mounted packaged assembly, high energy mixing chamber, volumetric metering pump, water solenoid valve, pressure switches and gauges, hose connections, ball valves.</li></ul>	1 duty + 1 stand-by
<b>Coagulant Metering Pumps</b> <ul style="list-style-type: none"><li>• Volumetric metering pumps, Diaphragm type, corrosion resistant skid mounted, complete with pump bases, variable speed drives, pressure relief valves, back pressure valves, check valves, calibration columns, isolation ball valves, flush connections, strainers, electric motors, piping and fittings.</li></ul>	1 duty + 1 stand-by

### III. Electrical Equipment – 1 x 14 MGD

#### PLC Based Control Panel(s)

The PLC based control panel(s) will be supplied to monitor and control the ACTIFLO® process. All panels are required to be installed **INDOORS ONLY**. Each control panel, will be completely assembled, tested and programmed for the required functionality. Each U.L. labeled panel will be designed according to the scope of supply listed below. The quantity of panels will be based on the number of ACTIFLO® trains in the design. There shall be one control panel per train for odd numbered train configurations and one control panel per two trains for even numbered train configurations.

The PLC Control Panel will include the necessary input/output as listed in the I/O listing. All I/O will be wired to field terminations and include surge arrestion and isolation as required.

One Train	Two Trains	Description	Manufacturer
1	1	NEMA 12 FREESTANDING ENCLOSURE (INDOOR INSTALLATION ONLY)	HOFFMAN
1	1	BACKPANEL	HOFFMAN
1	1	PANEL SHELF	HOFFMAN
1	1	SURGE PROTECTION	INNOVATIVE TECH
1	1	20A MAIN CIRCUIT BREAKER, 1-POLE, 120VAC (MCB)	SQUARE D
3	3	24VDC POWER SUPPLY 5A	SOLA
8	8	DC/DC TRANSMITTER ISOLATOR, 4-20 mA	PHOENIX
16	20	M-UFB 2/2-24 VDC MINITRAB SURGE ARRESTOR	PHOENIX
4	5	M-UFB R-4 MINITRAB BASE ELEMENT, 4 PLUGS	PHOENIX
1	1	SLKK 5 DOUBLE LEVEL TERMINAL BLOCK w/GND	PHOENIX
1	1	DIGI-KEY PART NO. 1.5KE30CATR DIODE	DIODES INC.
AS REQUIRED	AS REQUIRED	D-UKK 3/5 END COVER	PHOENIX
AS REQUIRED	AS REQUIRED	FB 10-6 FIXED BRIDGE BAR	PHOENIX
AS REQUIRED	AS REQUIRED	E/UK 1 END CLAMP	PHOENIX
96	128	UKK 5 DOUBLE LEVEL TERMINAL BLOCK	PHOENIX
2	2	2.0A CIRCUIT BREAKER	ALLEN-BRADLEY or equal
11	13	3.0A CIRCUIT BREAKER	ALLEN-BRADLEY or equal
2	2	7.0A CIRCUIT BREAKER	ALLEN-BRADLEY or equal
1	1	15.0A CIRCUIT BREAKER	ALLEN-BRADLEY or equal
30	30	TERMINAL BLOCK	ALLEN-BRADLEY
10	10	TERMINAL BLOCK (GND)	ALLEN-BRADLEY
AS REQUIRED	AS REQUIRED	CENTER JUMPER - 10 POLE	ALLEN-BRADLEY
AS REQUIRED	AS REQUIRED	END BARRIER	ALLEN-BRADLEY
AS REQUIRED	AS REQUIRED	END ANCHOR	ALLEN-BRADLEY
32	32	OUTPUT RELAY, 2PDT, FORM C CONTACT, 24VDC	ALLEN-BRADLEY or equal
32	32	RELAY BASES	ALLEN-BRADLEY or equal
1	1	SLC 5/05 PROCESSOR	ALLEN-BRADLEY
1	1	13 SLOT CHASSIS	ALLEN-BRADLEY
1	1	POWER SUPPLY	ALLEN-BRADLEY
1	1	RACK INTERCONNECT CABLE	ALLEN-BRADLEY
4	6	DC POWERED DISCRETE INPUT CARD	ALLEN-BRADLEY
2	2	DC POWERED DISCRETE OUTPUT CARD	ALLEN-BRADLEY
1	1	DC POWERED ANALOG INPUT CARD	ALLEN-BRADLEY
One Train	Two Trains	Description	Manufacturer

2	3	DC POWERED ANALOG OUTPUT CARD	ALLEN-BRADLEY
1	1	PANELVIEW 1000 WITH ETHERNET	ALLEN-BRADLEY
1	1	10/100 BASE T ETHERNET SWITCH	N-TRON
2	2	PUSH BUTTON, FLUSH, NON-ILL, MOM. N.O. CONTACT	SQUARE D
AS REQUIRED	AS REQUIRED	MISC. (WIRE, CABLE, WIRE DUCT, DIN RAIL, TERMINAL MARKERS, LEGENDS, NAMEPLATES, ETC.)	
1	1	CABINET LIGHT	
1	1	RECEPTACLE W/BOX/COVER, UL LISTED	
1	1	ALARM HORN (SUPPLIED LOOSE FOR MOUNTING BY CONTRACTOR)	

**IV. Process Instrumentation – 1 x 14 MGD**

Description	Units Per Train	Total No. of Units
• Raw Water Turbidimeter, Hach	--	1
• pH meter for raw water, Great Lakes	--	1
• pH meter after coagulant addition, Great Lakes	1	1
• Flowmeter, Danfoss	1	1
• Settled Water Turbidimeter, Hach	1	1

**V. Spare Parts – 1 x 14 MGD**

Description	Units Per Train	Total No. of Units
<b>Mechanical Spare Parts</b>		
• Coagulation tank mixer bearings and seals	--	1 set
• Injection tank mixer bearings and seals	--	1 set
• Maturation tank mixer bearings and seals	--	1 set
• Apex tips	3	3
• V-belt sets	3	3



## **SECTION SIX**

### **I. Krüger, Inc. Scope of Work**



### **I. KRÜGER SCOPE OF WORK**

- A. I. Krüger, Inc. is responsible for process design and equipment procurement required for ACTIFLO® System. The system will be designed and supplied in accordance with the applicable sections of the project Plans and Specifications as described herein. I. Krüger, Inc. scope of work does not include any engineering, selection, procurement, installation, or operation of any equipment, materials or other services not specifically defined in this proposal.
- B. Process and Design Engineering – I. Krüger, Inc. will perform engineering in accordance with the project Plans and Specifications and those applicable national codes, standards and / or regulations (except as otherwise noted) in effect at the time of this submittal. Additionally, I. Krüger, Inc. will provide all necessary design, installation and operating information for equipment within its stated scope of supply. I. Krüger, Inc. is not responsible for the design, selection, installation, operation or maintenance of any materials, equipment or services supplied by others.
- C. I. Krüger, Inc. will provide process engineering and design support for the system as follows:
  - 1. Equipment specifications for all equipment supplied by Krüger Inc.
  - 2. Technical instructions for operation and start-up of the system
  - 3. Equipment location drawings
  - 4. Equipment installation plans
  - 5. Project Specific O&M manuals
- D. The equipment scope of supply of I. Krüger, Inc. shall include the equipment as shown in the ACTIFLO® Scope of Supply.
- E. Field Services

I. Krüger, Inc. will provide the services necessary to start-up, test, and operate the system as follows:

  - 1. Advice during installation
  - 2. Equipment checkout and initial testing, 1 trip(s) with a total of 5 days.
  - 3. Start-up assistance, 2 trip(s) with a total of 10 days.
  - 4. Operator training, 1 trip(s) with a total of 5 days.



## **SECTION SEVEN**

### **Contractor Scope of Work**



### **CONTRACTOR SCOPE OF WORK**

**The following is a non-inclusive list of material that shall be furnished by the Contractor:**

1. Obtain necessary construction permits and licenses, construction drawings (including interconnecting piping drawings), field office space, telephone service, and temporary electrical service.
2. All site preparation, grading, locating foundation placement, excavation for foundation, underground piping, conduits and drains.
3. Demolition and/or removal of any existing structures, equipment or facilities required for construction, and installation of the Ballasted Flocculation system.
4. Supply and install all bulk storage tanks, pads, and supports including the concrete basins required for the ACTIFLO® system
5. Provide all grouting for the bottom of the settling tank.
6. Provide all concrete work for the ACTIFLO® tankage, including all corner fillets.
7. Provide and installation of all foundations, supply and installation of all embedded or underground piping, conduits and drains.
8. All backfill, compaction, finish grading, earthwork and final paving.
9. Receiving (preparation of receiving reports), unloading, storage, maintenance preservation and protection of all equipment, and materials provided by Krüger Inc.
10. Installation of all equipment and materials provided by Krüger Inc.
11. Supply, fabrication, installation, cleaning, pickling, and/or passivation of all stainless steel piping components.
12. Provide all imbedded pipe sections and valves for tank drains.
13. All cutting, welding, fitting, and finishing for all field fabricated piping.
14. Supply and installation of all flange gaskets and bolts for all piping components.
15. Supply and installation of all pipe supports.
16. Provide, install and terminate all motor control centers, motor starters, panels (other than the ACTIFLO® PLC panel), transformers, and VFD's.
17. Provide, install and terminate all variable frequency drive units as required by Krüger, Inc. for the each maturation tank mixer and each settling tank scraper.
18. Installation and termination of all control panels and instrumentation supplied by Krüger Inc.
19. Supply and install all sample pumps and sample lines required for the instrumentation provided by Krüger Inc.

20. Labor and material for winterizing the ACTIFLO® System; insulating/heat tracing any tanks, piping, or tubing subjected to freezing temperatures, and water heaters when polymer solution make-up water is expected to fall below 55 °F.
21. Supply and install all electrical power and control wiring and conduit to the equipment served plus interconnection between the ACTIFLO® Supplier's furnished equipment as required, including wire, cable, junction boxes, fittings, conduit, etc.
22. Supply and install all insulation, supports, drains, hold down clamps, manhole covers, condensate drain systems, wastewater valves, flanges, flex pipe joints, expansion joints, boots, gaskets, adhesives, fasteners, safety signs, and all specialty items such as strainers and traps.
23. Provide all labor, materials, supplies and utilities as required for start-up, and performance testing including laboratory facilities, analytical work and chemicals.
24. Provide all chemicals, lubricants, glycol, oils, or grease and other supplies required for equipment start-up or plant operation.
25. Provide all anchor bolts and mounting hardware.
26. Provide and install all piping required to interconnect to the ACTIFLO® Supplier's equipment including all microsand recirculation piping.
27. Provide all nameplates, safety signs and labels.
28. Provide, and install all support beams and/or slabs for mixers, scrapers, and/or chemical feed systems.
29. Provide all gratings, handrails, access hatches, ladders, and access platforms.
30. The Contractor shall coordinate the installation and timing of interface points such as piping and electrical with the ACTIFLO® Supplier.
31. Supply and install all sunshields and/or additional enclosures as needed when installing ACTIFLO® equipment and instrumentation outdoors.
32. All other necessary equipment and services not otherwise listed as specifically supplied by the ACTIFLO® Supplier

## **SECTION EIGHT**

### **ACTIFLO® Estimated Operating Costs**



**Preliminary Operating Cost Estimate**  
**ACTIFLO® System**  
**CH2M Hill-Boston – Site #21**

**Mechanical Equipment Summary per Train – 14 MGD**

<b>Equipment</b>	<b>1 x 14 MGD</b>	
Coagulation Tank Mixer	5	HP
Injection Tank Mixer	5	HP
Maturation Tank Mixer	7.5	HP
Scraper Motor	1.5	HP
Two Sand Recirculation Pumps	30	HP
<b>Total Power Requirements*:</b>	<b>49</b>	<b>HP</b>

**Estimated Operating Costs – 1 x 14 MGD**

<b>ACTIFLO® System:</b>			<b>1 x 14 MGD</b>
<b>Item</b>	<b>Estimated Average Dose</b>	<b>Estimated Unit Cost</b>	<b>Estimated Daily Operating Cost</b>
Polymer	1.2 mg/L	\$ 3500/ton	\$ 245.20
Sand Loss	2 g/m <sup>3</sup>	\$ 200/ton	\$ 23.25
Coagulant (Alum)	100 mg/L	\$ 280/ton	\$ 1,634.64
Power Consumption*	See table above.	\$0.08/KW hr	\$ 63.08
<b>Total Estimated Daily Operating Cost**</b>			<b>\$ 1,966.17</b>
<b>Operating Cost per 1,000 Gallons</b>			<b>\$ 0.141</b>

\*Assumes a power draw of 90% of nameplate rating and does not include stand-by equipment.

\*\* For nominal capacity operating 24 hours per day.

**Preliminary Operating Cost Estimates  
ACTIFLO® System  
CH2M Hill – Boston, MA – Site #52**

**Mechanical Equipment Summary per Train – 5 MGD**

<b>Equipment</b>	<b>1 x 5 MGD</b>	
One Coagulation Tank Mixer	2.0	HP
One Injection Tank Mixer	2.0	HP
One Maturation Tank Mixer	3.0	HP
One Settling Tank Scraper	0.75	HP
Two Sand Recirculation Pumps	15.0	HP
<b>Total Power Requirements:</b>	<b>22.75</b>	<b>HP</b>

**Estimated Operating Costs – 1 x 5 MGD**

<b>ACTIFLO® System:</b>			<b>5 MGD</b>
<b>Item</b>	<b>Estimated Average Dose</b>	<b>Estimated Unit Cost</b>	<b>Estimated Daily Operating Cost</b>
Polymer	1.2 mg/L	\$ 3,500/ton	\$ 87.57
Sand Loss	2 g/m <sup>3</sup>	\$ 200/ton	\$ 8.34
Coagulant (Alum)	100 mg/L	\$ 280/ton	\$ 583.80
Power Consumption*	See table above.	\$0.08/KW hr	\$ 29.29
<b>Total Estimated Daily Operating Cost**</b>			<b>\$ 709.00</b>
<b>Operating Cost per 1,000 Gallons</b>			<b>\$ 0.142</b>

\*Assumes a power draw of 90% of nameplate rating and does not include stand-by equipment.

\*\* For nominal capacity operating 24 hours per day.

**Preliminary Operating Cost Estimates**  
**ACTIFLO® System**  
**CH2M Hill – Boston, MA – Site #17**

**Mechanical Equipment Summary per Train – 12 MGD**

<b>Equipment</b>	<b>1 x 12 MGD</b>	
One Coagulation Tank Mixer	5.0	HP
One Injection Tank Mixer	5.0	HP
One Maturation Tank Mixer	7.5	HP
One Settling Tank Scraper	1.5	HP
Two Sand Recirculation Pumps	30.0	HP
<b>Total Power Requirements:</b>	<b>49.0</b>	<b>HP</b>

**Estimated Operating Costs – 1 x 12 MGD**

<b>ACTIFLO® System:</b>			<b>12 MGD</b>
<b>Item</b>	<b>Estimated Average Dose</b>	<b>Estimated Unit Cost</b>	<b>Estimated Daily Operating Cost</b>
Polymer	1.2 mg/L	\$ 3,500/ton	\$ 210.17
Sand Loss	2 g/m <sup>3</sup>	\$ 200/ton	\$ 20.02
Coagulant (Alum)	100 mg/L	\$ 280/ton	\$ 1,401.12
Power Consumption*	See table above.	\$0.08/KW hr	\$ 63.08
<b>Total Estimated Daily Operating Cost**</b>			<b>\$ 1,694.39</b>
<b>Operating Cost per 1,000 Gallons</b>			<b>\$ 0.142</b>

\*Assumes a power draw of 90% of nameplate rating and does not include stand-by equipment.

\*\* For nominal capacity operating 24 hours per day.

**Preliminary Operating Cost Estimates**  
**ACTIFLO® System**  
**CH2M Hill – Boston, MA – Site #26**

**Mechanical Equipment Summary per Train – 24 MGD**

<b>Equipment</b>	<b>1 x 24 MGD</b>	
One Coagulation Tank Mixer	7.5	HP
One Injection Tank Mixer	7.5	HP
One Maturation Tank Mixer	15.0	HP
One Settling Tank Scraper	3.0	HP
Two Sand Recirculation Pumps	40.0	HP
<b>Total Power Requirements:</b>	<b>73.0</b>	<b>HP</b>

**Estimated Operating Costs – 2 x 24 MGD**

<b>ACTIFLO® System:</b>			<b>48 MGD</b>
<b>Item</b>	<b>Estimated Average Dose</b>	<b>Estimated Unit Cost</b>	<b>Estimated Daily Operating Cost</b>
Polymer	1.2 mg/L	\$ 3,500/ton	\$ 840.67
Sand Loss	2 g/m <sup>3</sup>	\$ 200/ton	\$ 80.06
Coagulant (Alum)	100 mg/L	\$ 280/ton	\$ 5,604.48
Power Consumption*	See table above.	\$0.08/KW hr	\$ 187.96
<b>Total Estimated Daily Operating Cost**</b>			<b>\$ 6,713.17</b>
<b>Operating Cost per 1,000 Gallons</b>			<b>\$ 0.140</b>

\*Assumes a power draw of 90% of nameplate rating and does not include stand-by equipment.

\*\* For nominal capacity operating 24 hours per day.

## Facsimile

TO: Bruce Stevens                      DATE: 9/30/04  
COMPANY: F.R. Mahony & Associates      FROM: Kirk Newcomb  
FAX NO: bruces@frmahony.com      TOTAL PAGES: 8  
SUBJECT: CH2M Hill CSO ROMAG

Bruce,

Per your request I am sending preliminary sizing information for ROMAG screens for the above project for peak flows of 12.28, 14.22, 46.5 and 5.17 MGD. The ROMAG Screen was developed in Switzerland in 1990 and since then over 800 screens have been sold worldwide, mostly in Europe where stormwater issues preceded interest in North America.

The ROMAG Stormwater Screen has won 2 WEF 'Innovative Technology Awards' in 1998 and 2001 under the category of "collection systems".

For your project called CH2M Hill CSO with the possible peak flows of 12.28, 14.22, 46.5 and 5.17 MGD, your project has the potential to use the following options.

Site	ROMAG Model	Peak Flow	Length	Height	Budget
#17	RSW 4X3	12.28 MGD	12.6'	20.6"	\$103,950.00
#21	RSW 5X3	14.22 MGD	12.6'	24.4"	\$112,200.00
#26	RSW 5X7	46.50 MGD	25.7'	24.4"	\$154,550.00
#52	RSW 2X3	5.17 MGD	12.6'	13"	\$84,700.00

**NOTE:** There are other models of different measurements that could be used in place of the ones above for each site.

Budget pricing for ROMAG Screens includes the following:

- ◆ Screen in 304L stainless steel.
- ◆ Nema 4x controls
- ◆ Ultrasonic level sensor
- ◆ Hydraulic power pack driven by a 5 hp 230/460/3/60 motor
- ◆ External struts. We need to know where walls and ceilings are for attachment.
- ◆ Two days of start up assistance during 1 trip to the job site.
- ◆ Freight to the job site.
- ◆ Biodegradable hydraulic oil

Please note:

- ◆ The power pack should be placed in a building to be protected from freezing and the elements.
- ◆ Four 18" long rubber hose pig tails will be provided. Two each to be mounted on the power pack and two on the screen. The contractor is responsible for providing and anchoring the interconnecting stainless steel tubing. Stainless steel tubing to have 0.5" ID and overall system burst pressure shall not be less than 2500 psi.
- ◆ The mounting elevation of the screen should be as high as possible off the channel bottom to prevent grit deposition on the bottom of the screen.
- ◆ The screen is not designed for reverse flow. Reverse flow can damage the screen.

The CONTRACTOR is responsible for the following:

The concrete weir on which the ROMAG screen mounts must be level and horizontal with perpendicular side walls. This is very important!

- ◆ Unloading, uncrating and installation. (Note: Installation will, at minimum, require a forklift and possible a crane/hoist for larger units.
- ◆ Anchor bolts.
- ◆ Stainless steel hydraulic tubing as mentioned above.
- ◆ Electrical connection and interconnecting wiring of:
  - E-Stop button.
  - Motor.
  - Controls.
  - Level sensor.

The ROMAG Screen is sized assuming free discharge over the control weir or 0 point on the enclosed "Water Elevations Profile". This means that downstream conditions do not back up flow above the 0 point. A submerged 0 point or control weir:

- Can be caused by reverse flow through the screen. The rear of the screen is not designed for the removal of screenings.

- Will reduce the screen's ability to handle flow as well as cause the upstream water elevation to rise. If it rises enough then flow will by pass over the top of the screen. We cannot calculate the effects on flow or upstream water elevation with a submerged weir as there are no standard calculations for this purpose.

#### **NOTES:**

The ROMAG Screen does not remove solids so the management of the solids the ROMAG Screen deflects is extremely important to the success of the installation. In most cases the solids are allowed to get caught in the flow continuing on to the WWTP. Therefore we suggest a continuous flow to the WWTP.

The installation of ROMAG Screens are best served by a rising water elevation in front of the screen. This is best caused by a downstream restriction in the flow causing a back up of flow in the vicinity of the ROMAG Screen.

Please call Parkson or your local representative whose name and number is listed below with any further questions.

Sincerely,

Kirk Newcomb  
Product Specialist

Cc: DJK  
DGM

Enc: (3) RSW Drawings

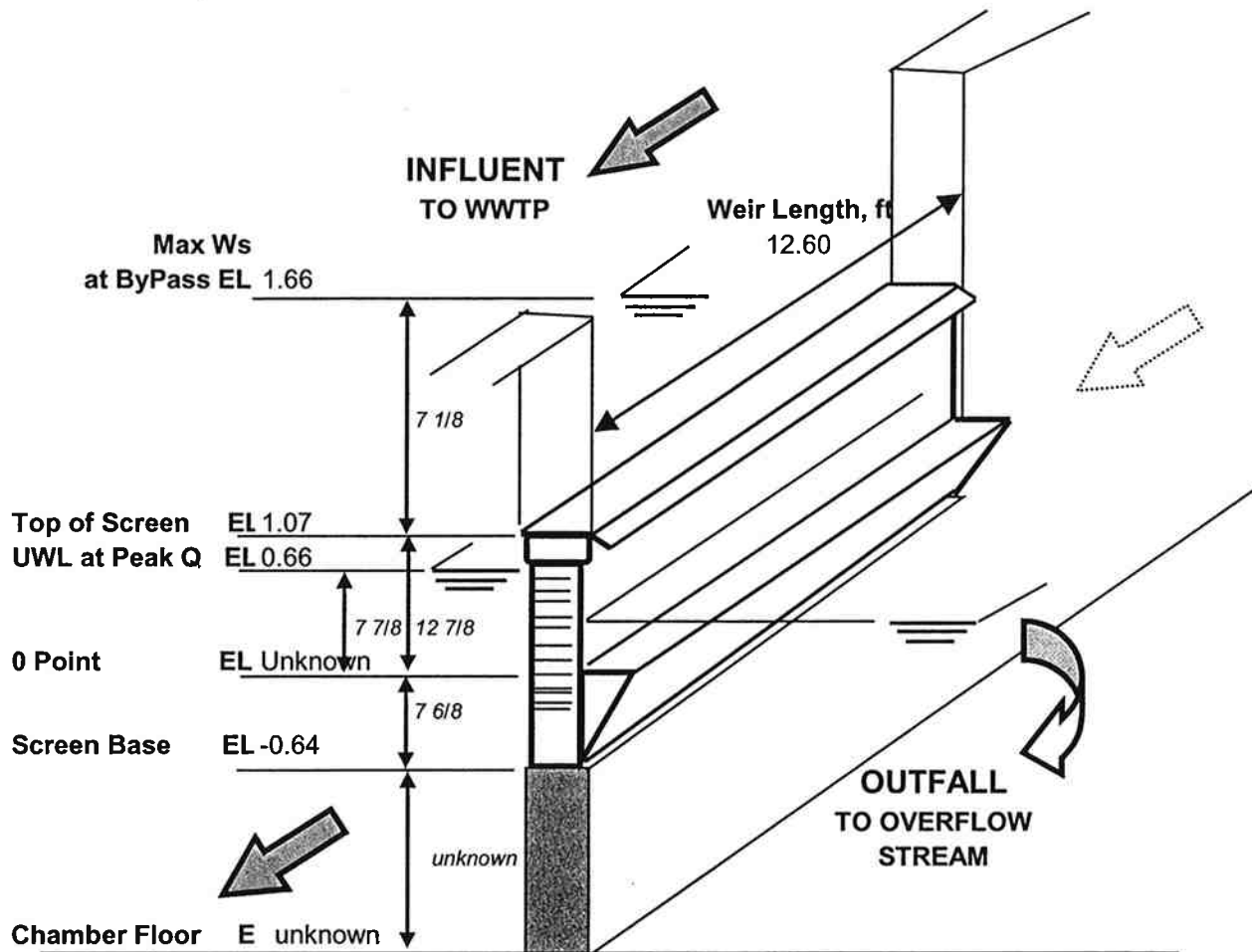
## **HYCOR ROMAG SCREEN**

### **Design Considerations for Model RSW**

#### **Establishing ROMAG Screen location relative to the CSO facility.**

1. Set the ROMAG Max Ws at ByPass Elevation at or below the maximum “collection system” water elevation. Note: Water levels above the maximum “collection” system water elevation may cause uncontrolled overflow and potential basement back-ups throughout the collection system.
2. Establish a Zero Point Elevation: This is the level which water will begin to overflow through the screen. Relative to the zero point, set the mounting elevation for the ROMAG Screen base.
3. Calculate the required tank dimensions (for a retention basin) or channel dimensions, with the beginning of a controlled overflow set at the Zero Point. Channel or tank side walls should be at least as high as the top of the screen or as high as the emergency discharge Max Ws.
4. Confirm the outfall water elevation is lower than the Zero Point Elevation. The Control weir (or 0 point) of the screen should not be submerged. Out falling water should not back up into the 0 point.
5. Review all water elevations for workable system hydraulic performance. If necessary, revise system and/or screen parameters.

## Hycor Romag Screen Water Elevation Profile

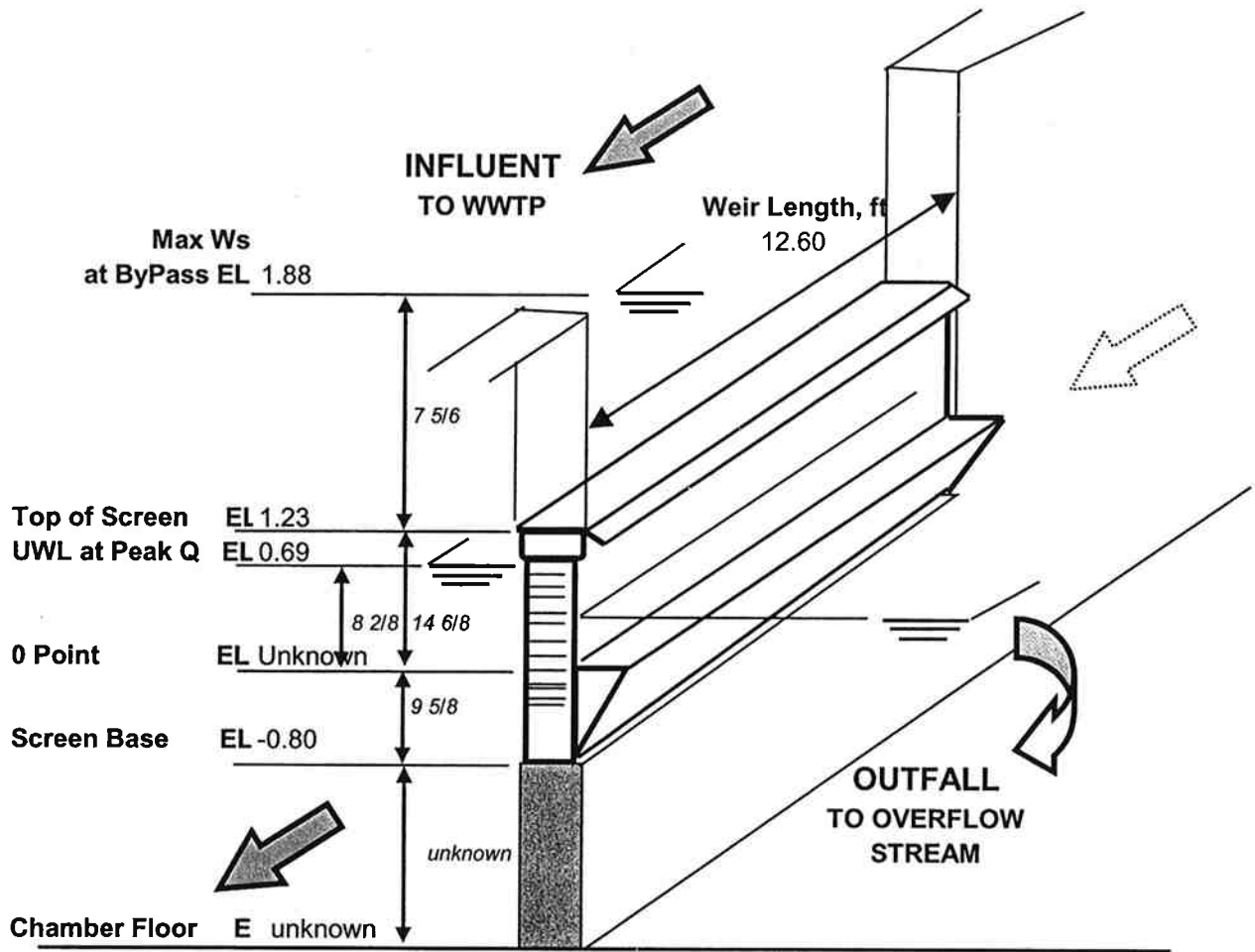


Note: El dimensions shown in feet, italic dimensions in inches

**Project Name** CH2M Hill CSO  
**Screen Model** RSW 4x3  
**Peak Flow** 12.28 mgd  
**Date** 09/30/04

**Screen Space Needed (min)**  
 Height 21.00 in  
 Width 13.12 ft

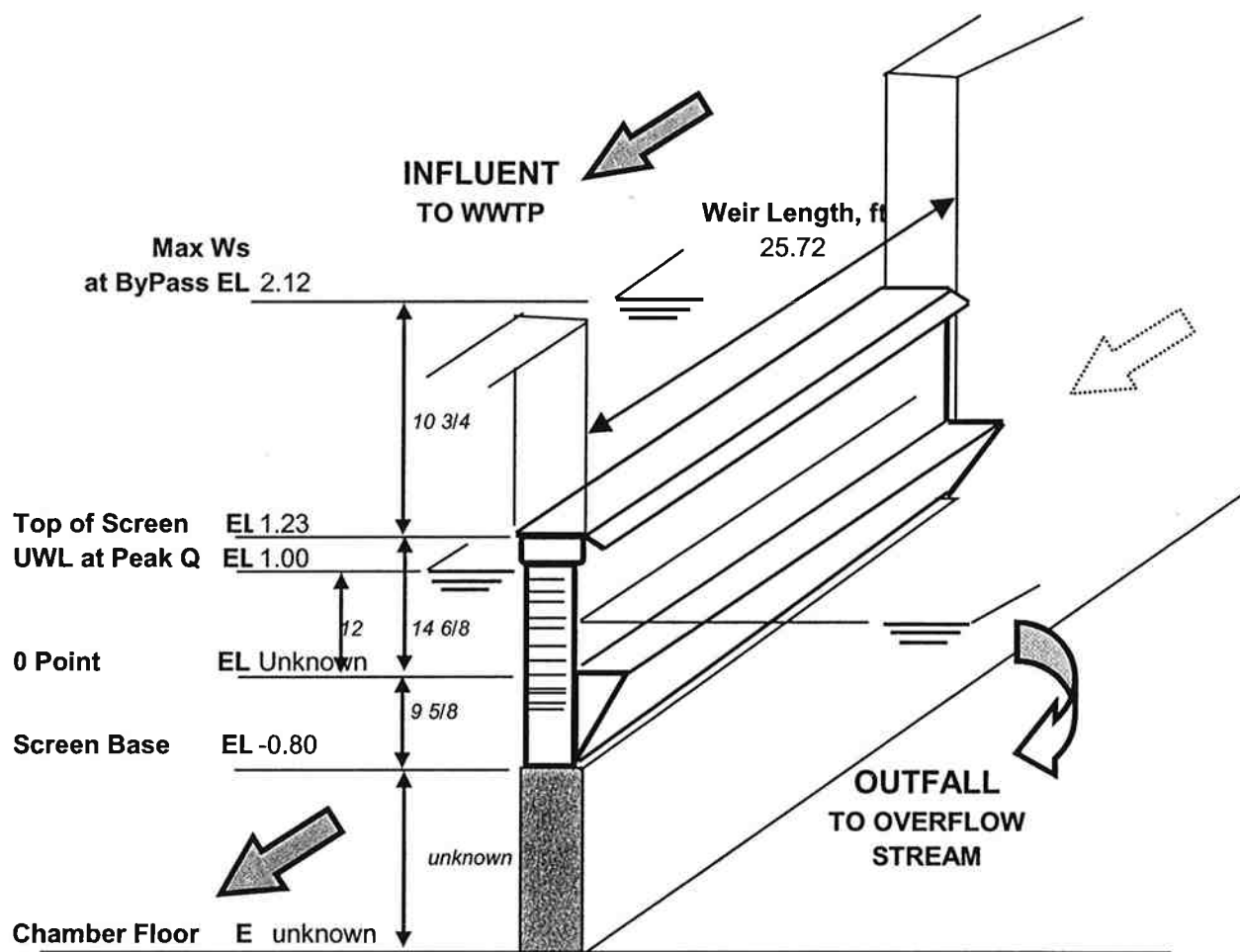
# Hycor Romag Screen Water Elevation Profile



Note: El dimensions shown in feet, italic dimensions in inches

<b>Project Name</b>	CH2M Hill CSO	<b>Screen Space Needed (min)</b>	
<b>Screen Model</b>	RSW 5x3	Height	25.00 in
<b>Peak Flow</b>	14.22 mgd	Width	13.12 ft
<b>Date</b>	09/30/04		

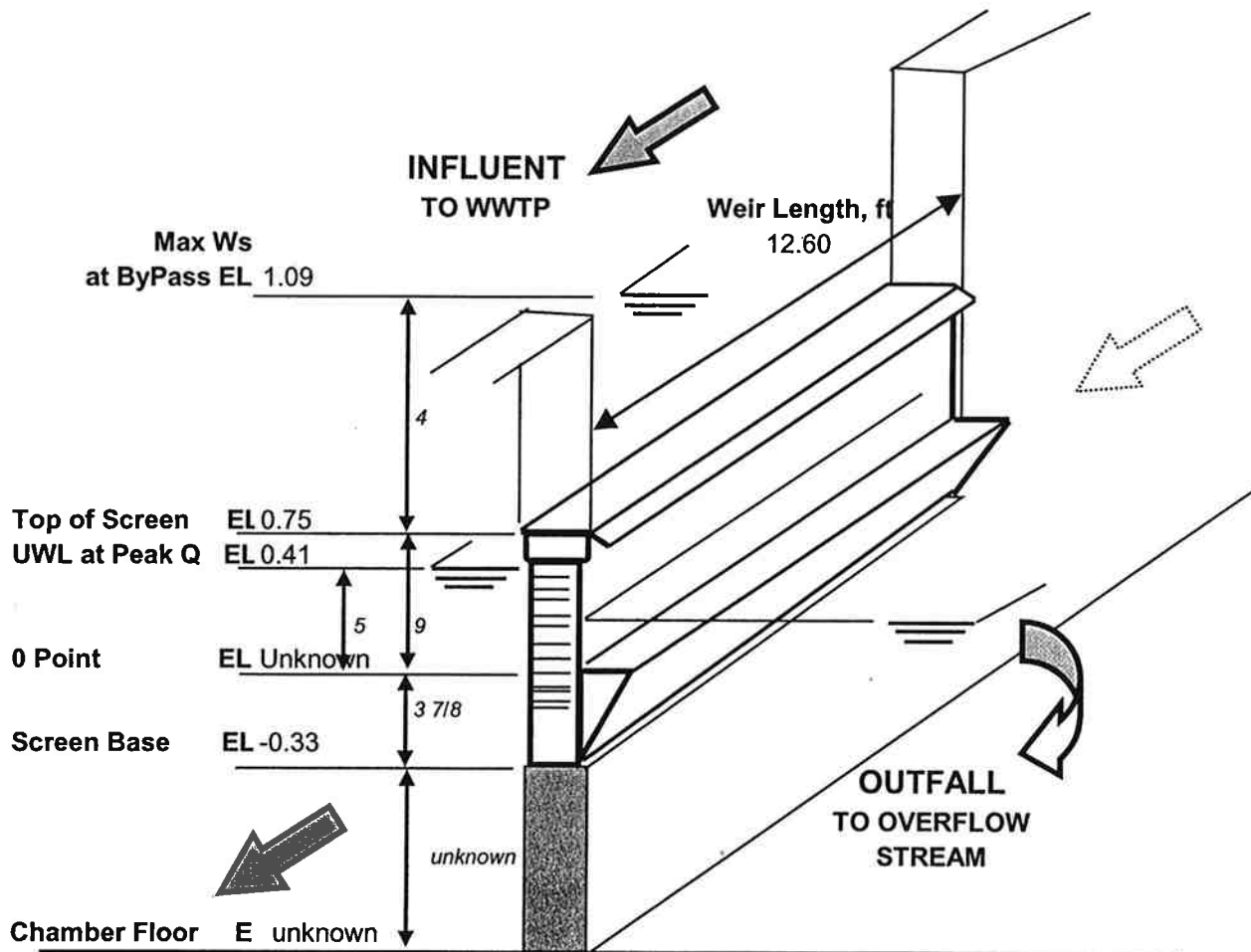
## Hycor Romag Screen Water Elevation Profile



Note: EL dimensions shown in feet, italic dimensions in inches

<b>Project Name</b>	CH2M Hill CSO	<b>Screen Space Needed (min)</b>	
<b>Screen Model</b>	RSW 5x7	Height	25.00 in
<b>Peak Flow</b>	46.50 mgd	Width	26.24 ft
<b>Date</b>	09/30/04		

## Hycor Romag Screen Water Elevation Profile



Note: El dimensions shown in feet, italic dimensions in inches

<b>Project Name</b>	CH2M Hill CSO	<b>Screen Space Needed (min)</b>	
<b>Screen Model</b>	RSW 2x3	Height	13.00 in
<b>Peak Flow</b>	5.17 mgd	Width	13.12 ft
<b>Date</b>	09/30/04		



**PARKSON CORPORATION**

**INSTALLATION, OPERATION AND MAINTENANCE MANUAL**

**FOR**

**(2) HYCOR® ROMAG SCREENS  
MODEL RMG0908W**

**SPECIFICATION SECTION 11330  
STORMWATER SCREENS**

**PROJECT NUMBER 580112  
SERIAL NUMBERS 58011202 and 58011203**

**PROJECT NAME AND LOCATION:**

**LITTLE BLUE VALLEY SEWER DISTRICT  
ATHERTON WASTEWATER TREATMENT PLANT IMPROVEMENTS  
INDEPENDENCE, MISSOURI**

**ENGINEER'S PROJECT NUMBER 21003349-164203/MKE**

**CONTRACTOR:**

**ALBERICI CONSTRUCTORS  
21208 EAST OLD ATHERTON ROAD  
INDEPENDENCE, MO 64058  
PHONE: (816) 796-1441**

**YOUR LOCAL PRODUCT REPRESENTATIVE:**

**FLUID EQUIPMENT COMPANY, INC.  
4225 NE PORT DRIVE, SUITE 100  
LEE'S SUMMIT, MO 64064  
PHONE: (816) 795-8511  
FAX: (816) 795-8926**

**PARKSON CORPORATION  
562 BUNKER COURT  
VERNON HILLS, IL 60061-1831 • U.S.A.  
(847) 816-3700 FAX: (847) 816-3707  
SERVICE: 1-888-PARKSON  
PARTS (TOLL FREE): 1-800-249-2140**



6/04

# **HYCOR® ROMAG UNIT RMG-W**

## **INSTALLATION, OPERATION AND MAINTENANCE MANUAL**



**PARKSON CORPORATION**

**HYCOR® PRODUCTS**  
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Dated: August 23, 2004

## **PREFACE**

THE OPERATING AND MAINTENANCE PROCEDURES OUTLINED IN THIS MANUAL ARE INTENDED AS GUIDELINES TO ASSIST THE OPERATING PERSONNEL IN THE DAY-TO-DAY OPERATION AND MAINTENANCE OF THE PARKSON UNIT OR EQUIPMENT. OPERATING PERSONNEL SHOULD ALWAYS FOLLOW PROPER SAFETY PROCEDURES IN ACCORD WITH BOTH INDUSTRY SAFETY STANDARDS AND THEIR OWN COMPANY SAFETY POLICIES WHEN PROCEEDING WITH OPERATION, MAINTENANCE AND REPAIR OF THE EQUIPMENT. THIS MANUAL IS NEITHER DESIGNED NOR INTENDED AS A SUBSTITUTE FOR SAFE OPERATING PROCEDURES WHICH MUST BE FOLLOWED WHILE IMPLEMENTING THE MAINTENANCE/OPERATION PROCEDURES OUTLINED IN THIS MANUAL. IT IS ASSUMED THAT OPERATION AND MAINTENANCE PERSONNEL ARE QUALIFIED AND EXPERIENCED. THE PRIMARY RESPONSIBILITY FOR SAFETY IN THE OPERATION AND MAINTENANCE OF THE PARKSON UNIT IS WITH THE OWNER-OPERATOR AND THE PERSONNEL CONDUCTING THE MAINTENANCE AND OPERATION.

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## SECTION ONE

Hycor® ROMAG RMG-W Unit  
GENERAL INFORMATION

### Safety Practices



**THIS UNIT CONTAINS A HIGH-PRESSURE HYDRAULIC CYLINDER. CONTACT WITH THE CYLINDER OR ANY MOVING PART DURING OPERATION WILL CAUSE SERIOUS INJURY.**

**THIS MACHINE MAY START AUTOMATICALLY.**

**TO PREVENT SERIOUS INJURY OR DEATH:**

- **CONSULT OPERATOR'S MANUAL BEFORE SERVICING.**
- **KEEP AWAY FROM ALL MOVING PARTS AND DISCHARGE CHUTES DURING OPERATION.**
- **DO NOT OPERATE MACHINE WITHOUT ALL GUARDS OR COVERS IN PLACE.**
- **FOLLOW LOCK OUT PROCEDURES BEFORE SERVICING: LOCK OUT POWER WITH PADLOCK FOR WHICH ONLY YOU HAVE THE KEY.**
- **NEVER SERVICE HYDRAULICS WITHOUT FIRST RELIEVING HYDRAULIC PRESSURE.**

**IN ADDITION TO THE ABOVE, IN ORDER TO AVOID UNSAFE OR HAZARDOUS CONDITIONS, THE FOLLOWING MINIMUM PROVISIONS MUST BE STRICTLY OBSERVED:**

- **THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.**
- **WHEN INSTALLING OR MAINTAINING THE ROMAG UNIT OR ASSOCIATED HARDWARE, BE SURE THAT ANY LIFTING EQUIPMENT IS OF SUFFICIENT CAPACITY BEFORE LIFTING OR MOVING THE ROMAG UNIT OR ASSOCIATED HARDWARE.**
- **MAKE SURE ANY ELECTRICAL CONNECTIONS ARE DONE BY QUALIFIED PERSONNEL AND ARE IN ACCORDANCE WITH ALL APPLICABLE CODES AND REQUIREMENTS.**
- **CONSULT MANUFACTURER'S MATERIAL SAFETY DATA SHEET PRIOR TO USE OF HYDRAULIC OIL. HYDRAULIC OIL MAY CAUSE SKIN IRRITATION. WASH CONTACT AREAS WITH SOAP AND WATER. HIGH PRESSURE ACCIDENTAL INJECTIONS THROUGH THE SKIN REQUIRE IMMEDIATE MEDICAL ATTENTION FOR POSSIBLE INCISION IRRIGATION AND/OR DEBRIDEMENT. NEVER SERVICE MACHINE BEFORE RELIEVING HYDRAULIC PRESSURE. IF EYE CONTACT OCCURS, FLUSH THOROUGHLY WITH WATER. IF EYE IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.**
- **DO NOT OPERATE A DAMAGED OR MALFUNCTIONING MECHANISM UNTIL NECESSARY ADJUSTMENTS OR REPAIRS HAVE BEEN MADE.**
- **OVERLOAD AND/OR SAFETY SWITCHES ARE EMERGENCY DEVICES. DO NOT USE THE OVERLOAD OR SAFETY SWITCHES TO STOP THE MECHANISM DURING NORMAL OPERATION.**
- **DO NOT OVERLOAD THE ROMAG UNIT OR USE IT FOR ANYTHING BUT THE INTENDED USE.**

- **DO PRACTICE GOOD HOUSEKEEPING. ALWAYS INSURE THE ROMAG UNIT IS KEPT CLEAN AND THE AREA AROUND THE ROMAG UNIT FREE OF POSSIBLE HAZARDS.**
- **ALWAYS OPERATE AND PERFORM MAINTENANCE IN A MANNER THAT PROMOTES SAFE CONDITIONS. ALWAYS USE THE PROPER TOOLS, WEAR THE PROPER CLOTHING, ETC. FOR THE TASK AT HAND.**
- **CONTACT WITH MATERIAL PROCESSED MAY CAUSE INFECTION OR ADVERSE REACTIONS. REPORT ANY CUTS OR INJURIES TO SUPERVISOR IMMEDIATELY AND SEEK APPROPRIATE MEDICAL ATTENTION.**
- **THIS PRODUCT HAS BEEN SUPPLIED WITH WARNING LABELS, SHOULD THEY BECOME DAMAGED, REMOVED OR ILLEGIBLE, PLEASE CONTACT PARKSON CORPORATION, FOR NO-COST REPLACEMENT LABELS.**

**WARNING LABEL PART NUMBERS FOR THIS PRODUCT IS 3824-041.**

**CALL TOLL FREE: 1-800-249-2140 OR  
FAX: (847) 837-4996  
PARKSON CORPORATION  
HYCOR® CORPORATION  
ATTENTION: PARTS DEPARTMENT  
562 BUNKER COURT  
VERNON HILLS, IL 60061-1831**

## Delivery and Inspection

The ROMAG unit and hydraulic power pack are delivered complete with all attachments and fittings.

After the unit has been unloaded, conduct a visual inspection and count of the shipping containers to determine if any shipping damage or material shortage occurred in transit.

Be careful not to jar crates or to puncture crated materials with lifting forks.

**NOTE:** You must report, in writing, any damaged or missing parts to the shipping carrier and Parkson Corporation within 48 hours of receipt of the unit. Purchaser shall bear the responsibility for the replacement of equipment which is determined to be missing after this period.

To assist in identifying correct quantities and parts, reference the attached packing list on the shipping crate. A purchase order shall accompany any order to Parkson Corporation for replacement of parts which were damaged during shipment. The purchaser shall direct all shipment damage back charges to the carrier.

## Storage

Equipment placed in storage and/or installed but awaiting start-up must be properly protected from damage. For long term, store the ROMAG unit indoors or adequately protected from weather if outdoor storage is necessary. Always store the hardware in their originally supplied shipping crates and protected from moisture, construction dust and corrosive fumes.

**NOTE:** Stainless steel units will appear to rust if contaminated with weld spatter, carbon steel dust from a grinding wheel or other airborne or waterborne contaminants.

Some material supplied for this job has had surface preparation and painting. Any bruises, mars and/or scratches caused by loading and unloading the equipment must be immediately touched up in the field prior to any storage.

**NOTE:** Any equipment painted with prime coats only should get additional coats of paint (to protect the surface under field storage conditions) within 14 days after receipt. Parkson Corporation will not accept any responsibility for rusting due to material which has not received additional paint in the field.

## SECTION TWO

### Hycor® ROMAG RMG-W Unit TECHNICAL DESCRIPTION



**REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.**

#### Application

The Hycor ROMAG unit is a storm water overflow screen used to remove or deflect solids during a high flow event. The trapped solids are collected for removal from the flow. The screened flow is either processed for further treatment or discharged into a natural water stream.

#### Unit Description

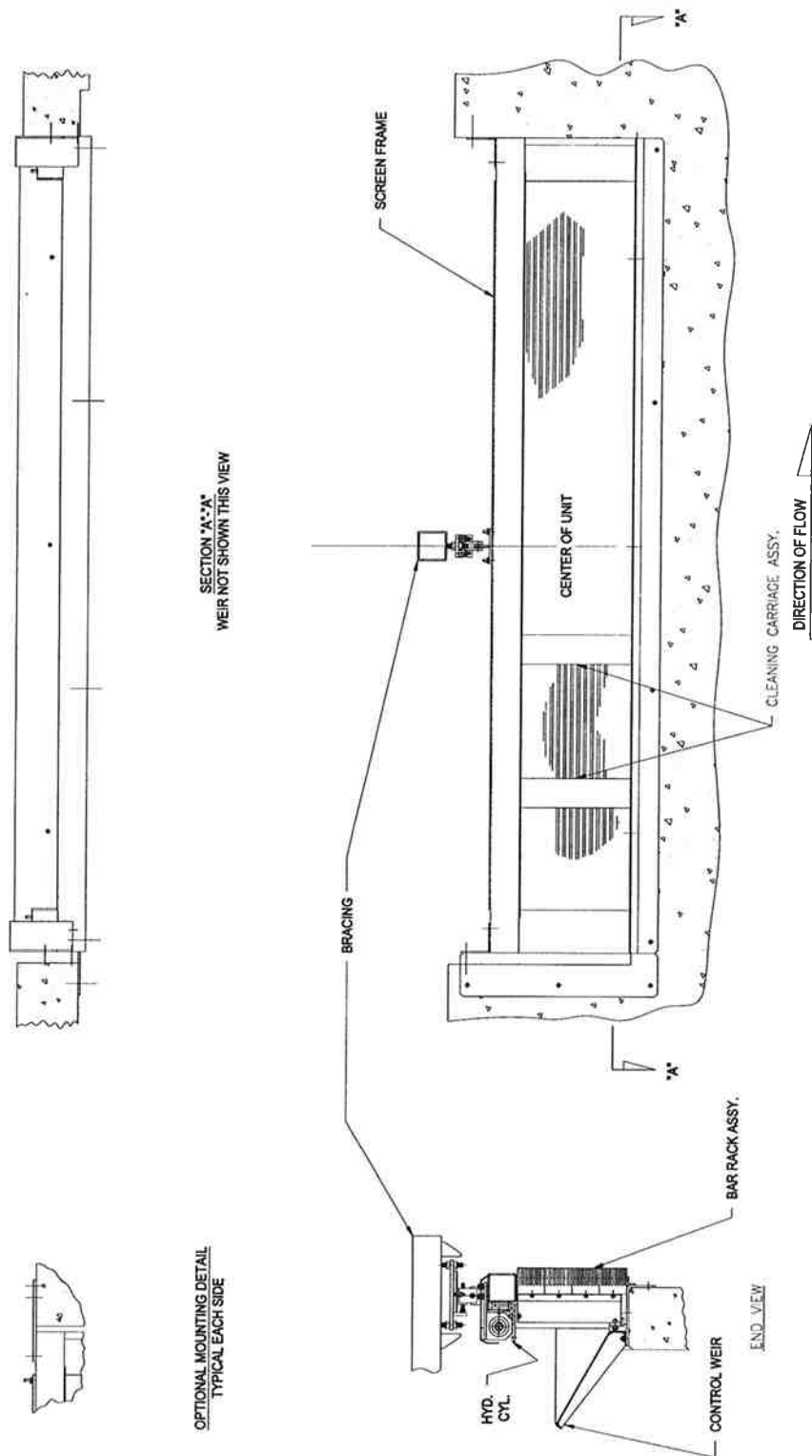
The ROMAG unit consists of a screen frame, bar rack assembly, cleaning carriage assembly, hydraulic power supply and controls.

The screen frame is furnished constructed of 316L stainless steel square tubing and angle, passivated after fabrication. Integral with the frame are the control weir and overflow weir. The control weir is designed to minimize the headloss gradient through the screen. If the water level exceeds the headloss through the ROMAG unit, the top of the frame will act as an emergency overflow weir to by-pass the unit.

The bar rack assembly is formed in modules of precision cut 316L stainless steel plates, spaced 4mm apart. Each module is fastened to the frame by socket head bolts. These bolts are also tightened to maintain tension in the bar rack assembly.

The cleaning carriage assembly is constructed of 316L stainless steel square tubing and angle framework with UHMW slide pads. Attached to the framework are combs fitted in between the bar rack spacing. These combs clean the bar rack assembly of trapped debris as well as provides support for bar racks along the unit's horizontal length.

The carriage assembly is operated by a reciprocating hydraulic cylinder. The hydraulic cylinder is connected to a yoke attached to the carriage framework and to the screen frame by means of a clamp. The cylinder's direction is automatically controlled by the operating pressures and initiated by the water level in the channel. Replaceable plastic slide blocks are installed on the carriage for reduced friction and wear.



Standard Equipment Layout

2-1A

The hydraulic power supply is a separate package suitable for operation at the unit or remotely. The package will normally consist of the following components:

- 3 phase electric motor
  - hydraulic gear pump
  - directional control valve
  - main relief valve
  - return oil filter
  - pressure gauge
  - oil level/temperature switch
  - oil reservoir tank fitted with oil level indicator, air breather, and fill port cap
  - interconnecting hydraulic hoses and fittings
- (Note: For hose lengths greater than 10 feet, it is recommended that hydraulic tubing be used instead.)

The general operating parameters are as follows:

	Pressure Relief Valve						
Length Modules	2	3	4	5	6	7	8
2	1750 psi		1750 psi		2200 psi		
3							
4							
5							
6							
7							
8							
9	1750 psi		2200 psi				
10							
11							
12							
13							
14							

### Operation

The ROMAG unit's operation is initiated by a level sensing device in the channel. In the case of a "slow" rising/decreasing water level, screens should start just as, or slightly before, the water level in the channel reaches the lowest bars of the screen.

In the event of rapidly rising water levels, the start level should be placed at elevations lower than the bottom of the screen.

Upon sensing a start level, the cleaning carriage assembly will stroke back and forth, keeping the bar racks clear of solids. The solids are directed downstream to be captured in the flow going to the wastewater treatment plant.

The screened flow can be collected for further treatment or discharged into a receiving body of water.

Screens should shut off when the water has receded below the start point. As a general rule, the Stop point can be placed at approximately 3 inches under the start point.

Should large objects impede the motion of the cleaning carriage, the hydraulic cylinder will short stroke to prevent unit damage.

**Also, the screens should not be started when water is already flowing through the screen over the control weir. Under this condition the screen will blind quickly and water will continue to rise. The hydraulics can not move a full screen of matted material under the flow and static pressure of the water.**

The design and shape of the cleaning carriage combs allow wedged items to be dislodged and directed downstream for collection.

In the event of flows exceeding the capacity of the unit, or power failure, the top of the ROMAG screen acts as an overflow weir to prevent upstream flooding.

## SECTION THREE

### Hycor® ROMAG RMG-W Unit INSTALLATION



#### **REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.**

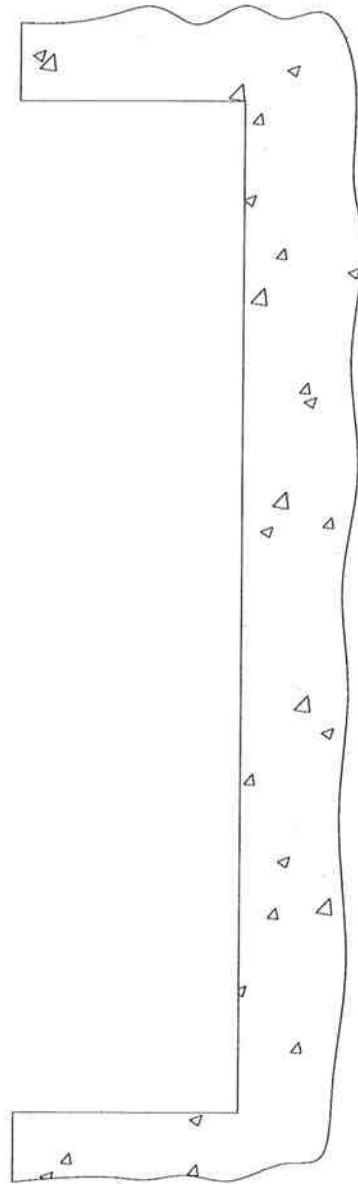
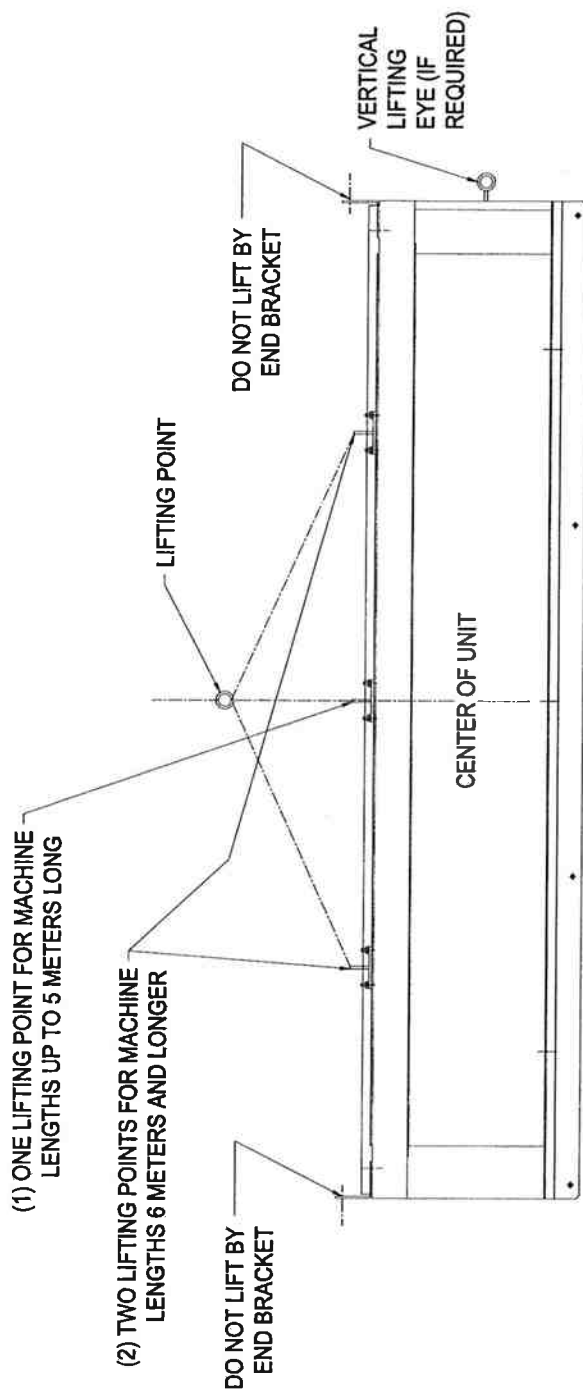
The RMG-W type ROMAG screen is shipped in multiple assemblies for final assembly on site. The following procedures insure that installation will be speedily and safely accomplished. The following are the major steps to installing a ROMAG unit.

Pre-Installation  
Concrete Preparation  
Lifting  
Mechanical Installation  
Hydraulic Installation  
Setting Operational Pressure  
Electrical Installation

**These steps must be followed or problematic operation is likely to occur!!**

#### Pre-Installation

1. Verify that lifting and transport equipment of suitable capacity is available. The shipping crates most often can be lifted from underneath with a fork lift truck. However, the unit also can be hoisted by the lifting points on the top frame. If the screen is to be lowered into the chamber vertically, a lifting eye has been installed on the end of the screen. (See page 3-1A)
2. If the installation requires the screen to be leak proof, remove the control weir on the back side of the screen. Caulk the flange of the control weir and re-attach weir to the unit. If required, this can be done once the unit has been lowered into the basin.
3. When installing the screen in an existing facility, drain or pump water away from all sides of the screen.
4. If installed in and active sewer, bypass channel flow around the area where the screen is to be installed. This will insure a safe working environment. Take extreme precautions when using electric power tools around water.



## Lifting Points

3-1A

5. If water cannot be drained, provide water tight platforms on both sides of the screen.
6. Installers and inspectors must have access to the mounting elevations of both sides of the screen. Temporary platforms should be placed on both sides of the screen if the screen mounting elevation is over 4' above the floor.
7. The area must have good lighting. Indoor installations should use portable halogen work lights.
8. A water supply with a garden hose must be provided during installation.
9. Ropes, pulleys and a come-a-long should be available to mount the support struts if the crane is not available or possible to use.
10. Wood timbers (2X4's & 4X4's) should be available to support or adjust the screen while it is being set on the concrete wall.
11. The contractor should have the following tools available during the installation:
  - A. 12-18" long level.
  - B. 4' long level.
  - C. One set of channel locks.
  - D. Two crescent wrenches - 12" - 18".
  - E. One 2-5 pound sledge hammer.
  - F. Clean buckets to transfer oil to the hydraulic power packs. Impress the contractor on the importance of not contaminating oil or leaving hydraulic tubing open for dirt and dust to get in system. If so, unit will have to be disassembled and cleaned.
  - G. Minimum of 2 ladders suitable for the installation to give access to the screens.
  - H. One 4" grinder.
  - I. Two sizes of Roto-hammers for drilling anchor bolt holes. A larger one is used for normal drilling. A small one is needed to drill base plate mounting holes. For small screens, a right angle drill design is required because there is not enough clearance for even small drills.
  - J. 1/2" diameter by 5" and 6" long masonry drill bits in suitable numbers to complete the installation.

- K. Stainless steel shim stock available; washers in various sizes large diameters, up to 1/8" thickness. More will be required when the concrete walls are not level and square.
  - L. 5 to 6 tubes of silicone per unit to be installed, and a caulk gun.
  - M. Masking tape, paper towels, small bottle of liquid detergent, rubbing alcohol or thinner and a grease cleaner.
  - N. Carpenter's square.
  - O. Passivation paste for cleaning areas that were cut or ground off.
  - P. Extra bolts and a few drop in anchors for the bolts.
- 12. Special Care Must Be Taken To Not Contaminate The Hydraulic Tubing, Oil or Hydraulic Power Units During The Installation.
  - 13. There are two stainless steel hydraulic lines coming out of the screen. One tall and one short, connect the short line to the "B" end of the carriage valve on the power pack.
  - 14. The hydraulic lines should be securely anchored to the walls.

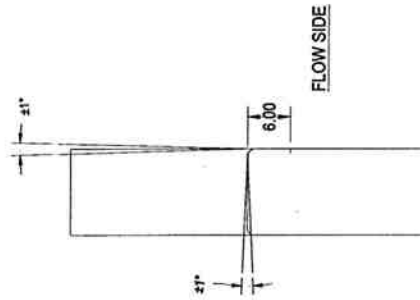
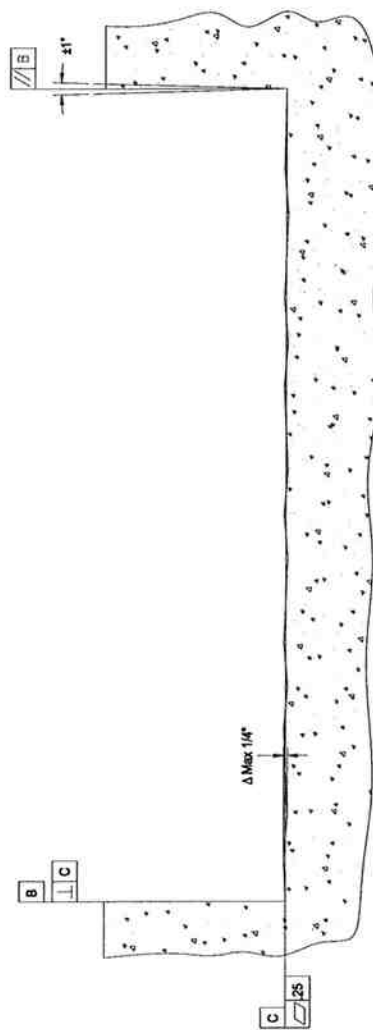
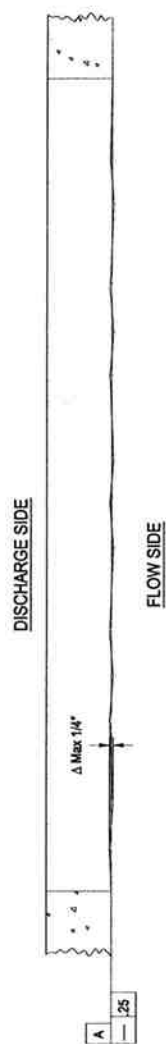
Concrete Preparation (See page 3-3A)

**NOTE:** The **CONDITION OF THE CONCRETE** is the most critical aspect of the installation of the screen. The time and cost of installation can be increased exponentially, due to concrete quality. **EVEN SLIGHT DEVIATIONS IN THE CONCRETE MAY MAKE THE SCREEN IMPOSSIBLE TO INSTALL**, until corrections have been made.

Prior to installation of the screen, the installing representative will check the condition of the concrete. If the concrete fails to meet the following test, the screen cannot be installed. From page 3-3A tolerances should be held to 1/16<sup>th</sup> of an inch.

This Pre-Installation Test involves the following:

- The end walls that the screen will attach to will be checked with a level for vertical. Tolerance 91° to 89°.
- All corners will be checked with a square. Tolerance 91° to 89°.



### Concrete Preparations

3-3A

- The influent vertical wall will be checked with a string line. This will require drilling holes in the concrete and setting drop-in anchors and a bolt. Tolerance will be a maximum of 6 mm (1/4 inch) across the width of the opening. **[That is from the highest spot to the lowest spot, the maximum difference has to be 6 mm (1/4 inch) or less.]**
- The top of the wall that the screen will sit on will also be checked with a string line. Tolerance will be a maximum of 6 mm (1/4 inch) across the width of the opening. **[That is from the highest spot to the lowest spot, the maximum difference has to be 6 mm (1/4 inch) or less.]**
- Look for local imperfections (dips or ridges) along the top of the wall that the screen will sit on, or along the influent vertical wall. These will have to be filled in or removed.

Cut/notch or pour concrete weir to required length and depth shown on the installation drawings. A total allowance of 2" is required to facilitate the installation of the screen. The weir opening should be square and level.

After concrete work is completed, inspect concrete for square, level and flatness on the top and influent surface of the concrete.

Remove any grease, and/or scum around the concrete opening using an alcohol based cleaning agent or other suitable concrete cleanser before the screen is placed on the concrete wall.

### Lifting

After the preparatory concrete work has been completed, the screen is ready to be installed.

The screen can be lifted by the support bracing mountings on the unit. Depending on the screen's length there may be one or two locations. Do not lift the unit by the end brackets. (See page 3-1A)

The screen must be lifted and installed horizontally. Do not tilt screen beyond 30°.

If your screen has to fit vertically into the containment, it will have been fitted with a removable lifting lug on the side of the unit. (See page 3-1A)

### Mechanical Installation

Lay rubber pieces on top of wall to make a continuous length of seal. Cut and fit rubber as necessary.

Set the screen down into the concrete opening.

Slide the screen tight against the downstream side of the opening. There should only be a 2" gap on the tensioning bolt side of the screen. The bottom flange of the screen should be pushed up to the wall as tight as possible.

Level the screen in the opening, using a 4' level. Shim as required along the length of the screen at each bolt hole location, but do not block the bolt hole.

Just below the combs there is a horizontal angle welded to the bottom flange. With a straight edge and chalk draw a horizontal line on the concrete, on both ends of the unit, in line with the lower edge of the angle. On this line, about 8" to 10" away from the unit drill a hole and set a drop-in anchor with a screw sticking out of the concrete. (See page 3-5A)

Tie a tight string between the two bolts. Adjust the string 30 to 40 mm, (pick a specific distance, example 36mm) away from the concrete wall at the bolts. Measure in millimeters, the distance from the flange to the string at the two end mounting holes of the screen. (See page 3-5B)

If - the two end holes on the flange are roughly the same distance to the string, (+/-5 mm tolerance or 1/4 of an inch), adjust the string so that it is the same distance from the two end holes (+/- 1 mm, tolerance). (See page 3-5B)

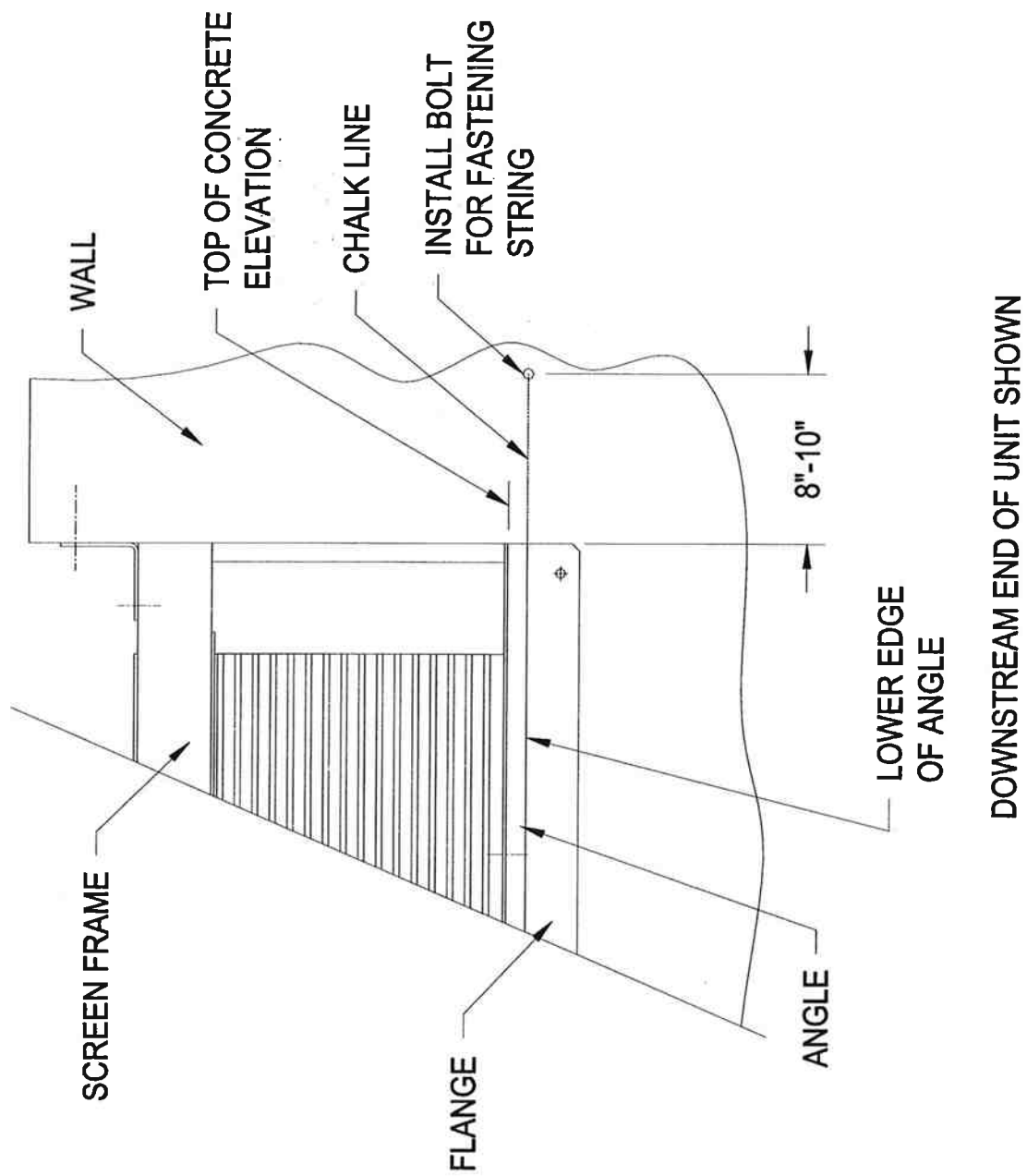
IF NOT - rotate (square) the screen so that the two ends are the same distance to the string, (+/-5 mm tolerance or 1/4 of an inch). Then, adjust the string so that it is the same distance from the two end holes (+/- 1 mm, tolerance). (See page 3-5B)

With the screen in line with the string, drill holes in the concrete using the holes in the flange as a template. Place anchor bolts in holes with enough threads available to adjust later. Shim gaps between the flange and wall with stainless steel shims. Use shims to adjust the screen so that the distance between the flange at each bolt hole, and the string is the same distance along the full length of the screen, tolerance 2 mm. Tighten unit to wall.

Plumb the screen (vertical) on the down stream end and anchor the top flange plate to the wall. Plumb the screen (vertical) on the up stream end and drill holes for anchoring. Place a stainless steel spacer between the wall and the flange in the area of the 2" gap. Anchor top flange to wall.

Drill holes in the lower flange using the bolt holes as a template. Insure that shims installed are the correct height. Remove any length of anchor bolt that will impede the travel of the cleaning carriage assembly. Passivate any areas that were cut or ground down to prevent the appearance of rusting.

**NOTE:** Holes under the carriage may not all be accessible until the unit is operational and the carriage can be moved. Do not move the carriage until all debris has been removed from within the unit and the bottom has been thoroughly soaked down with water, to prevent damage to the cleaning carriage.



String Installation

3-5A

Attach the support braces and brackets to the screen and wall as depicted in the equipment drawings. (Note: Very small screens may not require support braces.) The brace adjusting block, which attaches directly to the screen should be installed with all the settings in the middle of the adjustment range. Install all horizontal members using a 4' level.

Remove the shipping brace(s) on the face of the screen. Replace the bolts to prevent debris from fouling the interior of the upper and lower frames. Note: Small units may not have shipping braces.

Using two installation brackets for a string line, (install the brackets on the two outer top overflow weir bolt locations), and run a string from bracket to bracket. Adjust string distance from the frame to a set distance in millimeters (1mm tolerance) at each bracket location. (See page 3-6A)

Check distance from the frame to the string at each support mounting location, use the adjustments on the brace adjusting block to push or pull the unit into alignment with the string (1 mm tolerance). On units with two (2) or more brace locations, adjust each support mounting location and re-check previous location(s) for changes.

From the weir side of the unit, measure the internal distance from top frame to the bottom frame, at the two ends of the screen. (See page 3-6B) Measure this same distance under the mounting assembly(s). Use the adjustments on the brace adjusting block to raise or lower the top frame so that the top of the unit is level (2 mm tolerance).

Once the top of the screen has been leveled and straightened, re-check and readjust, if the adjustments made have effected the other settings.

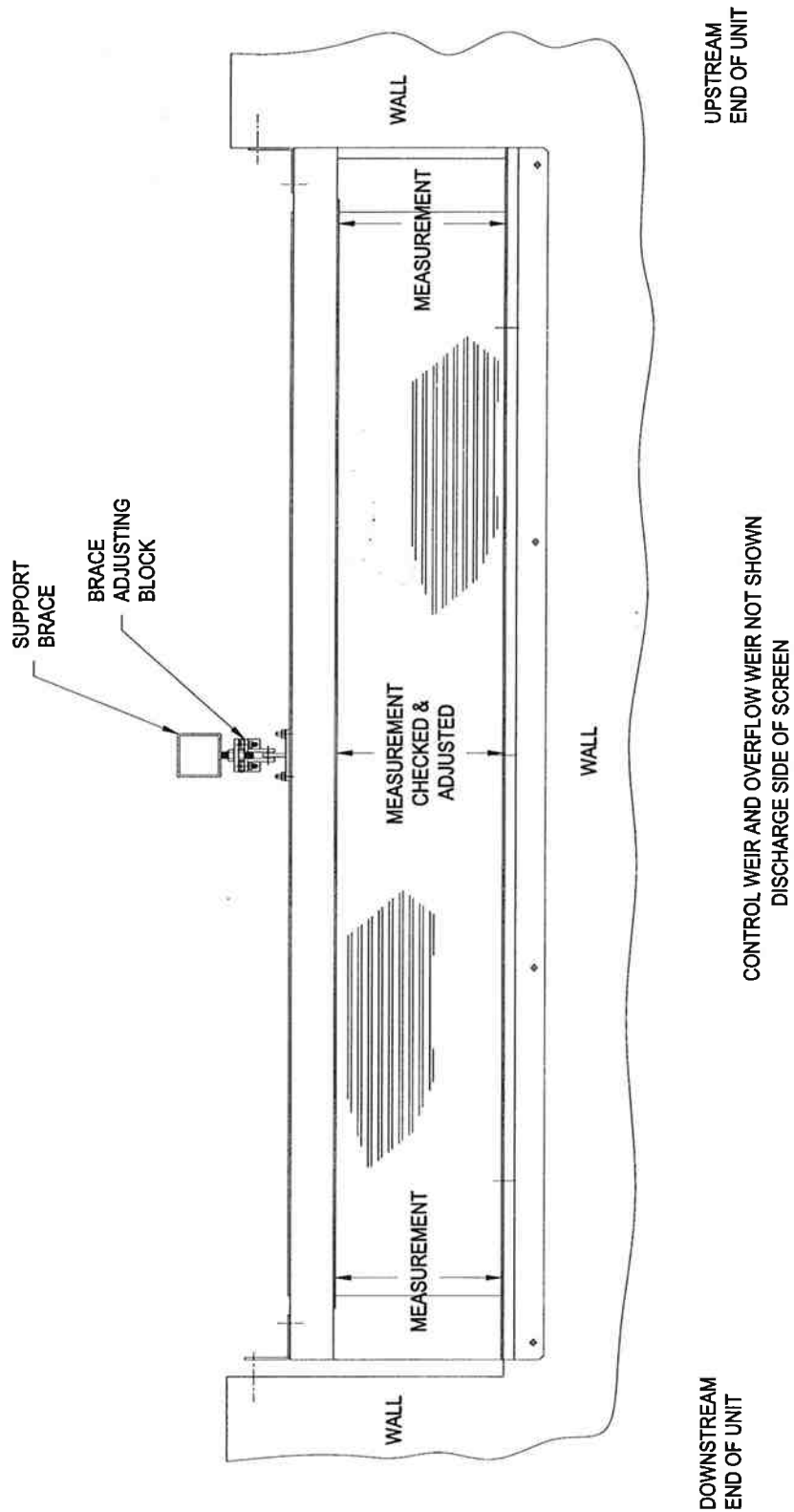
Attach the weir support brace(s) to the weir and concrete. The ends may have to be bent slightly to match the weir and concrete. (See 3-6C)

Butt the vertical end plate (See 3-6D) against the screen on the tensioning bolt end of the screen and anchor it to the wall. The plate should be touching the screen just behind the tensioning bolts. The bottom of the plate should be in line with the bottom of the flange on the screen.

Remove the spring loaded flap covering the screen tensioning bolts, if applicable. Tighten the screen tensioning bolts (See 3-6E) with a 14mm allen wrench. Start in the middle and work up and down from the center. Repeat this process on all the tensioning bolts to achieve uniform tension. Improper tensioning will result in a twisted screen frame. Uniform tension is essential for proper operation. Reattach the spring loaded flap to the screen.

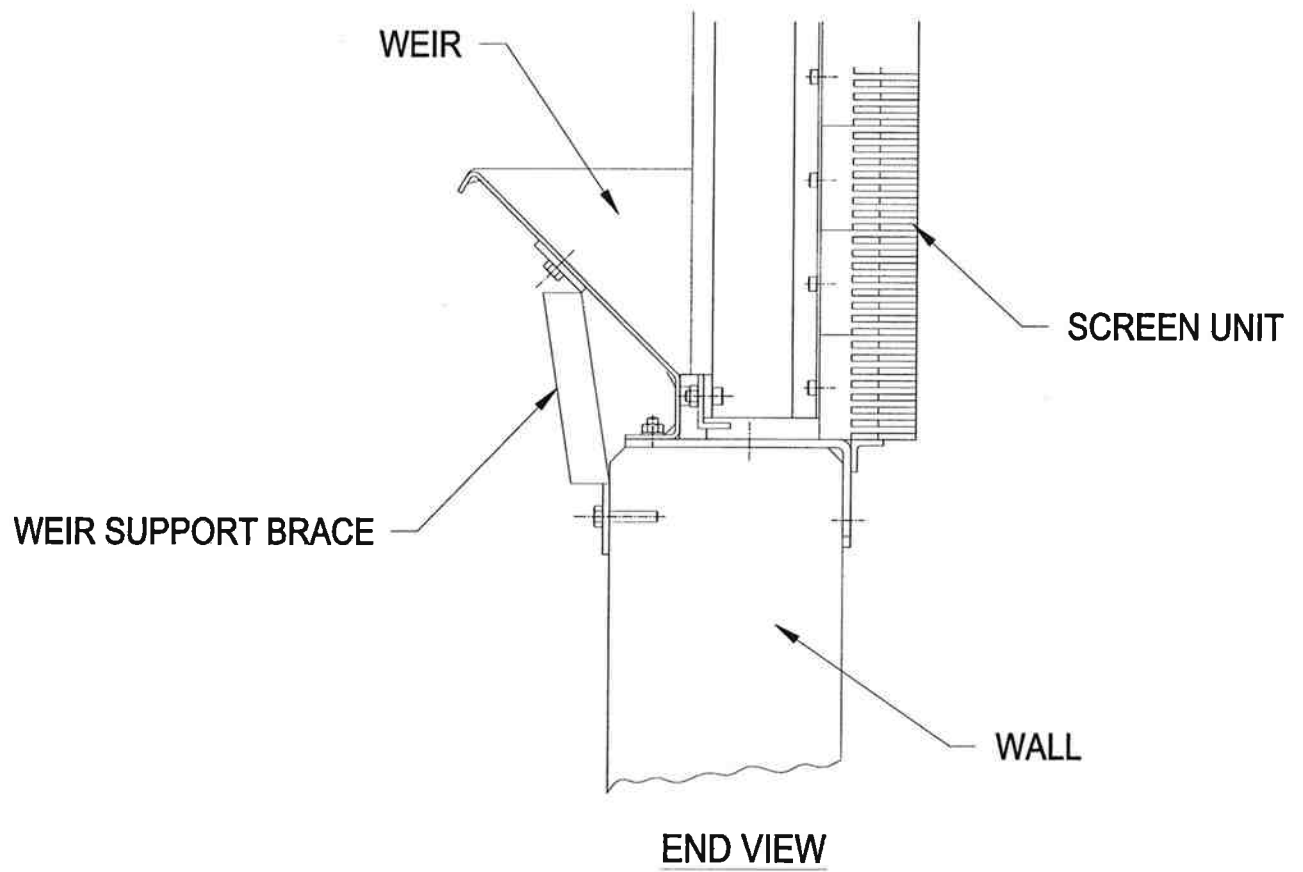
Length	Tension Torque Value						
	2	3	4	5	6	7	8
	25 Nm (31 ft-lb)			30 Nm (41 ft-lb)		35Nm (48 ft-lb)	





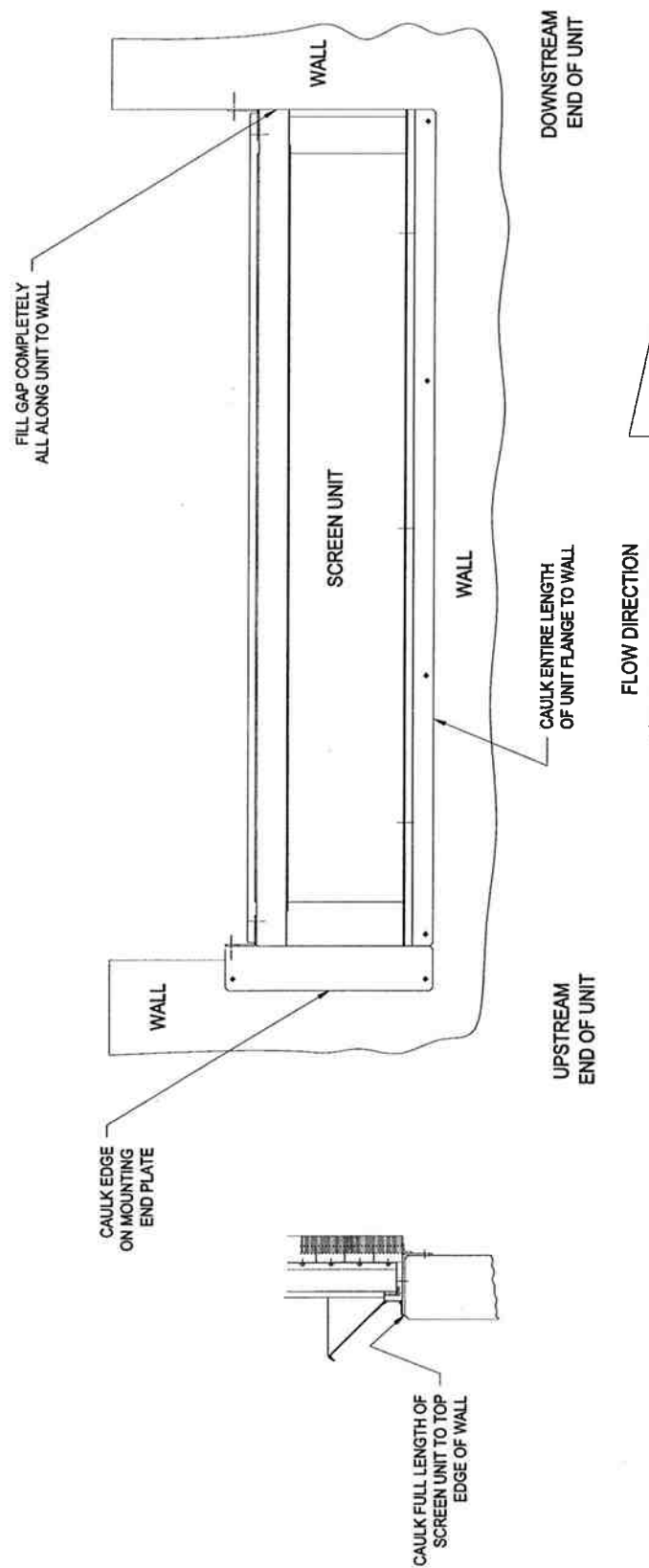
Final Vertical Alignment

3-6B



Weir Support Bracing

3-6C



### Caulking Locations

3-6D

With the screen and all components installed. Clean any masking tape marks left from shipping the unit with alcohol or thinner.

Wash all areas to be caulked with an alcohol based primer to remove grit or grease.

Dry all areas to be caulked.

Tape stainless steel pieces prior to chalking for a clean finish.

Apply caulk to bottom and sides of screen. (See page 3-6D)

The gap (approx. 2") between the upstream end of the screen and the concrete wall on the discharge side of the screen has to be filled with concrete up to and including the anchor bolts on the side of the screen. (See page 3-7A)

#### Hydraulic Installation



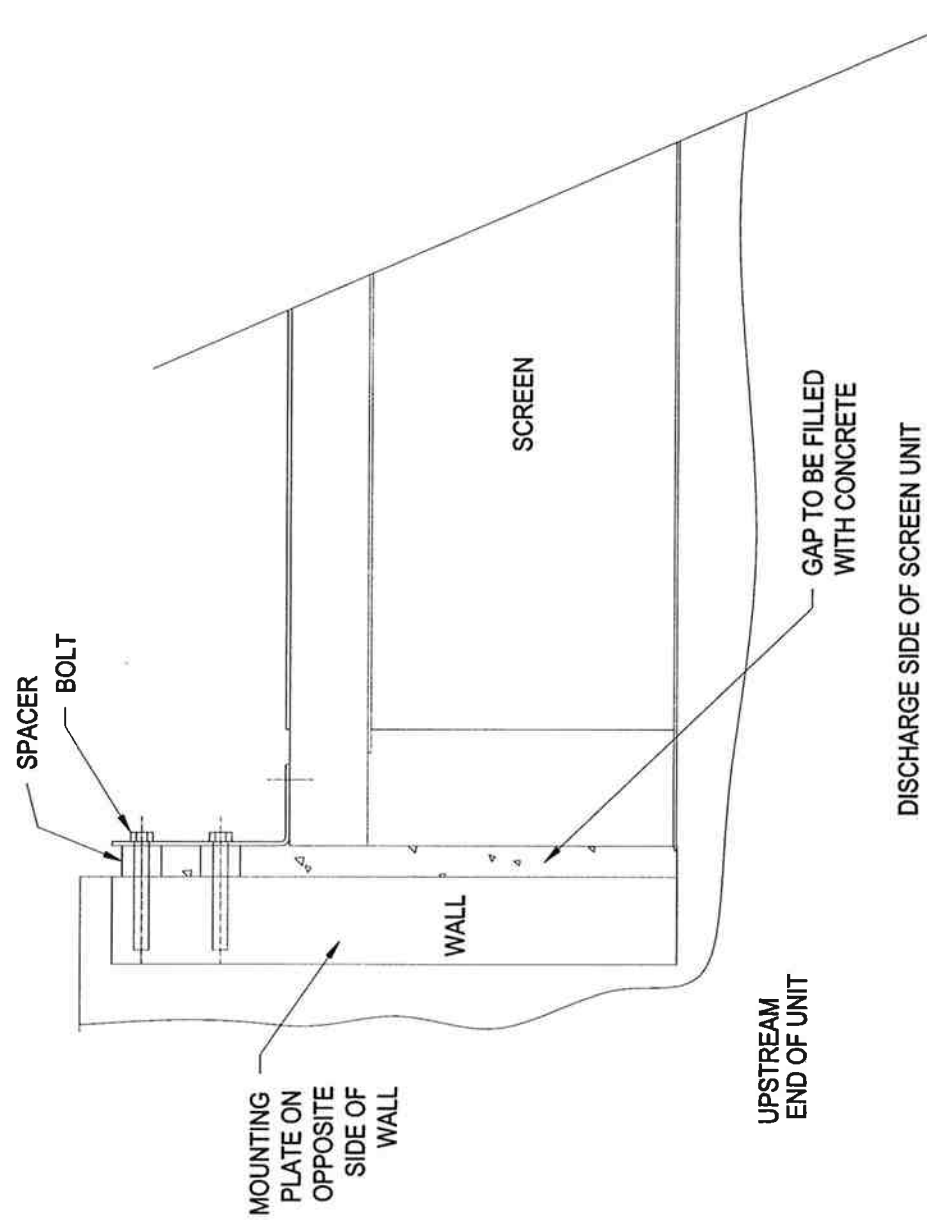
**CONSULT MANUFACTURER'S MATERIAL SAFETY DATA SHEET PRIOR TO USE OF HYDRAULIC OIL. HYDRAULIC OIL MAY CAUSE SKIN IRRITATION. WASH CONTACT AREAS WITH SOAP AND WATER. HIGH-PRESSURE ACCIDENTAL INJECTIONS THROUGH THE SKIN REQUIRE IMMEDIATE MEDICAL ATTENTION FOR**

**POSSIBLE INCISION IRRIGATION AND/OR DEBRIDEMENT. NEVER SERVICE BEFORE RELIEVING HYDRAULIC PRESSURE. IF EYE CONTACT OCCURS, FLUSH THOROUGHLY WITH WATER. IF EYE IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.**

Follow all SAE recommended practices to insure good workmanship and a safe installation.

The manufacturer recommends the contractor only use long radius bends on the stainless steel hydraulic tubing.

Be sure that proper air circulation is provided to prevent overheating of the motor. If the power pack is enclosed, make provisions to allow heat dissipation from the hydraulic system.



### Caulking Locations

3-7A

Secure the hydraulic power pack in place. It is recommended that the hydraulic power pack be placed in a containment curb for safety and housekeeping. It is also recommended that the hydraulic power pack be placed off the floor. To properly drain the tank, the drain plug is installed at the base of the tank. Raising the unit off the floor allows the ease in changing the hydraulic fluid.

Connect the hydraulic hose assemblies between the power pack to the hydraulic cylinder. The "B" side of the hydraulic valve should be connected to the shorter of the stainless steel stub ends on the screen.

**NOTE:**      **Make sure that the hoses and hose connections are clean, do not remove the caps from the connections until ready to install the power unit. For distance over 10', use hydraulic tubing with short hoses on either end to complete the conduit connection. All stainless steel and rubber tubing should be securely anchored to the walls.**

If the hydraulic lines are to pass through a concrete wall, it is recommended that hydraulic tubing be grouted in the wall to conduct the hydraulic fluid through the wall. If the screen and the power pack are within 10', hose can be use to complete the conduit.

The hydraulic power pack is shipped complete, except for hydraulic fluid. The reservoir should be filled to the black upper line on the sight gauge with approximately 10 gallons of high quality anti-wear, anti-foam hydraulic fluid as listed in the Lubrication Chart on page 5-3. It is recommended that the oil be poured in the tank using a clean funnel, pouring can, or pumped directly from the oils original container.

**NOTE:**      **Viscosity changes with temperature and it may be desirable to check with your local oil supplier for specific oils suitable for winter and summer use.**

## Electrical Installation

Prepare for the electrical installation by verifying the power requirements for the hydraulic power pack's motor and the control panel. Consult the electrical control schematic for the control interconnect and supply power wiring. Be sure the unit is well grounded.

Reference the motor nameplate for proper power supply and wiring connection data. Wire leads as directed by the diagram on the motor terminal box.

Review the control schematics for termination of the accessory switches such as: channel level; hydraulic oil level; and oil heater (if required). Terminals are normally provided in the control panel for interconnection wiring by the local electrician.



**MAKE SURE ANY ELECTRICAL CONNECTIONS ARE DONE BY QUALIFIED PERSONNEL AND ARE IN ACCORDANCE WITH ALL APPLICABLE CODES AND REQUIREMENTS.**



## SECTION FOUR

### Hycor® ROMAG RMG-W Unit OPERATING INSTRUCTIONS



**REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.**

**THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.**

#### Start Up Procedures

Before starting the ROMAG unit's motor, make an installation check on the following:

- ROMAG unit installed per the installation drawing and the anchor bolts are tight.
- Clean the screen area clear of debris. It is important to clear the installation area of sand, stones and debris.
- Hydraulic hoses not damaged and all connections are tight.
- Properly identify the correct supply power with respect to motor nameplate data.
- Check that all lubrication points are lubricated.
- Check hydraulic fluid level and verify the correct fluid has been added.
- Set level sensing device.

Prepare personnel for start up. Normally, the ROMAG unit is delivered set in such a way that the work cycle starts when the electric motor of the hydraulic power supply starts.

Recheck the screen tensioning screws for proper tension after the test run.



**THIS UNIT CONTAINS A HIGH-PRESSURE HYDRAULIC CYLINDER. CONTACT WITH THE CYLINDER OR ANY MOVING PART DURING OPERATION WILL CAUSE SERIOUS INJURY.**

Prior to performing the test run, open the bypass valve located near the hydraulic cylinder. This will create a closed loop in the hydraulic lines by bypassing the hydraulic cylinder and will purge the air from the hydraulic lines.

**NOTE:** On initial start up, observe the direction of rotation of the motor. It should rotate in the direction of the arrow (clockwise direction when viewed looking down on the motor). Run no longer than 20 seconds. Check hydraulic oil level and refill as necessary. To reverse the motor rotation, switch any pair of input electrical power leads. Observe the pressure gauge on hydraulic power supply. If pressure builds on the gauge, wiring is correct.

After proper motor rotation has been verified, switch the unit on "Hand".

Run the hydraulic unit for approximately 1 to 2 minutes to remove air from the hydraulic lines. For longer hydraulic lines, this process may take longer. Take all precautions to prevent contamination of the hydraulic system. Add hydraulic oil to the reservoir as needed. After air has been purged from the lines, close the bypass valve. The cleaning carriage should begin to move.

At the end of the carriage stroke, open the bypass valve to remove any air that may have been trapped in the cylinder. After running for 1 to 2 minutes, close the bypass valve. The cleaning carriage should change direction. Open the bypass valve when the cleaning carriage is extended to the opposite end of the screen and repeat the last step again. Finally, close the bypass valve and observe the carriage operation.

During the operating time, the cleaning carriage assembly is completely governed by the oil flow and the oil pressure. Consequently, no electric control is required for continuous reciprocating operation except that which runs the motor. (Should additional controls be supplied, refer to the necessary logic diagrams for control start up.) Allow the hydraulic cylinder to stroke several times. In the event the operating pressure needs to be reset or adjusted, see the step by step procedure in Section Six - Repair and Replacement.

When the unit is switched off, the carriage assembly will stop immediately.

### Adding Flow

After the ROMAG unit has been dry run satisfactorily, influent can be added into the channel.



**FOLLOW LOCK OUT PROCEDURES BEFORE SERVICING: LOCK OUT POWER WITH PADLOCK FOR WHICH ONLY YOU HAVE THE KEY.**

### Shutdown Procedures

Short Duration - The ROMAG unit may be stopped for short durations of time without any undesirable effects. For a duration of greater than 24 hours, the cleaning carriage assembly and bar rack should be thoroughly hosed down to prevent solids from sticking to bar racks.

Long Duration - When the ROMAG unit is shut down for expected long durations, the unit should be thoroughly hosed down to remove solids from sticking to bar racks. Reference Section Six - Repair and Replacement.



## SECTION FIVE

### Hycor® ROMAG RMG-W Unit MAINTENANCE



# DANGER



**REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.**

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**FOLLOW LOCK OUT PROCEDURES BEFORE SERVICING: LOCK OUT POWER WITH PADLOCK FOR WHICH ONLY YOU HAVE THE KEY.**

The ROMAG unit is a simple device needing little maintenance over its serviceable lifetime.

Make frequent visual inspections of the mechanical operation on a regular basis. Follow the maintenance instructions below and in the Maintenance Schedule on page 5-4, to extend the life of your machine and decrease the overall operating cost of your system.

#### First Ten (10) Operating Hours

Check the threaded connections on the hydraulic pipes and hoses.

Check the tension of the bars.

#### Monthly (or after storm event)

Observe that the unit functions smoothly under load conditions. If any strange sound or abnormal movement is noted, investigate the cause and correct the problem in accordance with the maintenance procedures of this manual.

Perform routine housekeeping - remove accumulated debris from screen and from level sensing components.

### Monthly (cont'd.)

Visually inspect the tension of the bars.

Check all threaded connections (hydraulic, structural).

Check hydraulic oil level.

Check the level of the hydraulic fluid in the reservoir (see page 5-2A). The oil level should be approximately mid way between the low level mark (red line at the bottom of the oil level indicator) and the maximum fill level (black line at the top of the oil level indicator). The oil level indicator also has a thermometer to give the temperature of the fluid. Reservoir temperature should not exceed 150°F. (65°C). System reliability and component service life will be reduced when system is operated at higher temperatures.

Inspect the cleaning carriage assembly for excessive wear. Replace plastic and bronze cleaning combs, if necessary.

### Semi-Annually

It is recommended that every 2500 hours operating time or twice a year, whichever occurs first, the hydraulic oil filter should be replaced. (See page 5-2A.)

### Annually

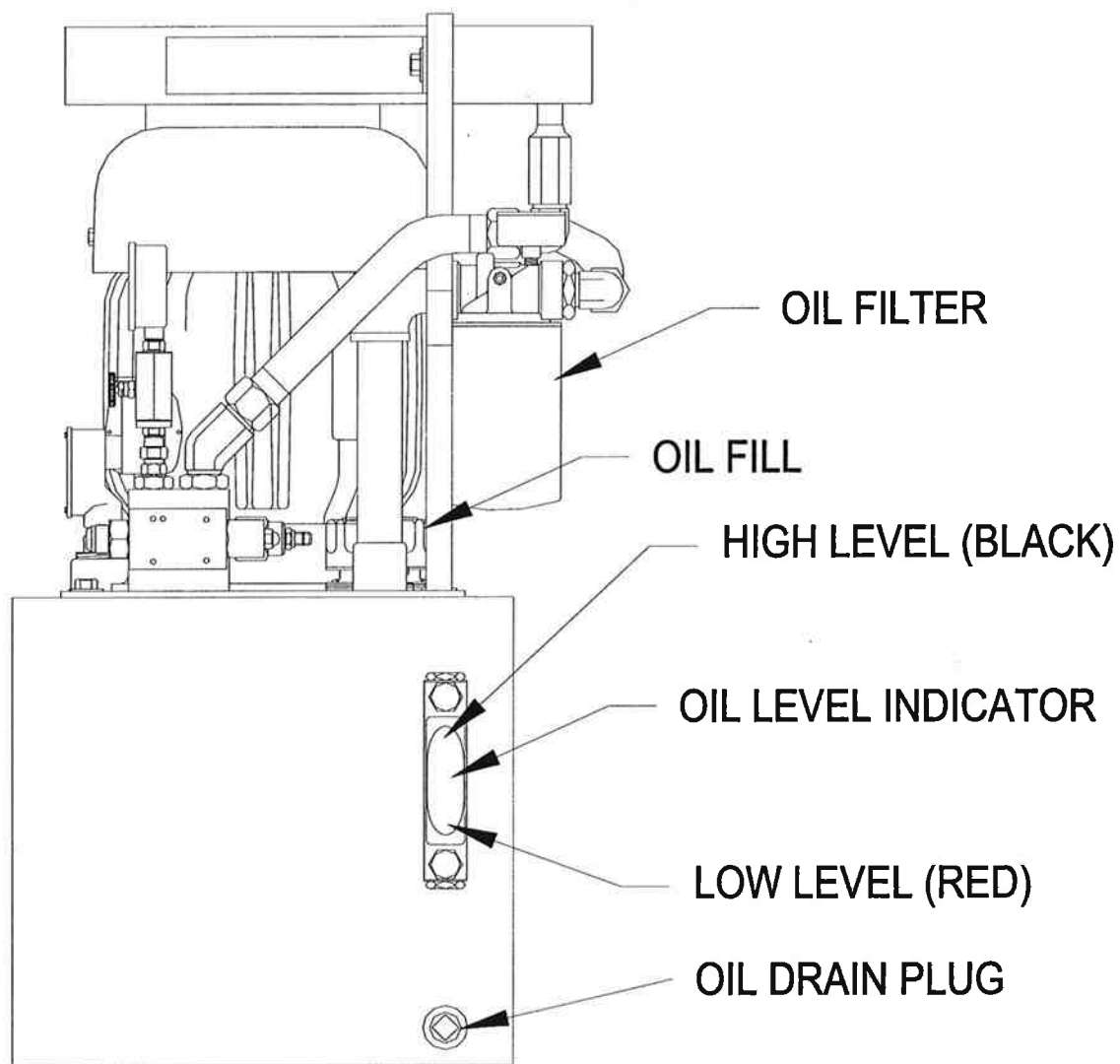
Observe the hydraulic oil operating limitations and change the oil accordingly or at least every 1000 operating hours or once a year. For high use applications, change oil after 700 working hours.

Check screen tension by testing tensioning screws at the end of bar racks.

To drain the hydraulic oil, remove the pipe plug located at the bottom of the hydraulic tank below the sight gauge (see page 5-2A). Reinstall the plug and fill with approximately 10 gallons of hydraulic fluid through the oil fill (see page 5-2A), while observing the oil level indicator (see page 5-2A). Fill until the oil level is midway between the low level mark (red line at the bottom of the oil level indicator) and the maximum fill level (black line at the top of the oil level indicator). Run the ROMAG unit through several cycles. Add oil as necessary. Always change the oil filter when changing the hydraulic oil.

Lubricate motor bearings at least every 5000 operating hours or once a year (see page 5-2A). See the chart on page 5-4 for hydraulic fluid and motor grease type.

**NOTE:**      **When changing or adding oil, use care to maintain cleanliness.**



Hydraulic Power Pack Lubrication Points

5-2A



**DANGER**



**CONSULT MANUFACTURER'S MATERIAL SAFETY DATA SHEET PRIOR TO USE OF HYDRAULIC OIL. HYDRAULIC OIL MAY CAUSE SKIN IRRITATION. WASH CONTACT AREAS WITH SOAP AND WATER. HIGH PRESSURE ACCIDENTAL INJECTIONS THROUGH THE SKIN REQUIRE IMMEDIATE MEDICAL ATTENTION FOR POSSIBLE INCISION IRRIGATION AND/OR DEBRIDEMENT. NEVER SERVICE MACHINE BEFORE RELIEVING HYDRAULIC PRESSURE. IF EYE CONTACT OCCURS, FLUSH THOROUGHLY WITH WATER. IF EYE IRRITATION PERSISTS, SEEK MEDICAL ATTENTION.**

## MAINTENANCE SCHEDULE

PROCEDURE	FIRST TEN (10) OPERATING HRS.	MONTHLY	SEMI- ANNUALLY	ANNUALLY
Check threaded connections on hydraulic pipes and hoses.	•			
Check tension of bars.	•			
General visual inspection.		•		
Routine housekeeping - remove debris from screen and from level sensing components.		•		
Visually inspect tension of the bars.		•		
Check all threaded connections.		•		
Check hydraulic oil level		•		
Inspect cleaning carriage.		•		
Change hydraulic oil filter.			•	
Check screen tension.				•
Change hydraulic oil.				•
Lubricate motor bearings.				•

## LUBRICATION CHART

APPLICATION	LUBRICANT		
Hydraulic Power Unit		Oil Temperature	
		10 - 150°F.	40 - 170°F.
		DTE24 Rando HD32 Tellus 32	DTE25 Rando HD46 Tellus 46
Hydraulic Oil	Mobil Oil Corp.: Texaco Inc.: Shell Oil Co.:		
Environmental Oil	Bioblend: Mobil Oil Corp.:	22032 EAL-224H	22046
Motor	Texaco Inc.: Premium RB Shell Oil Co.: Dolium R Chevron Oil Co.: SRI No. 2		



## SECTION SIX

### Hycor® ROMAG RMG-W Unit REPAIR AND REPLACEMENT



**REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.**

**THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.**

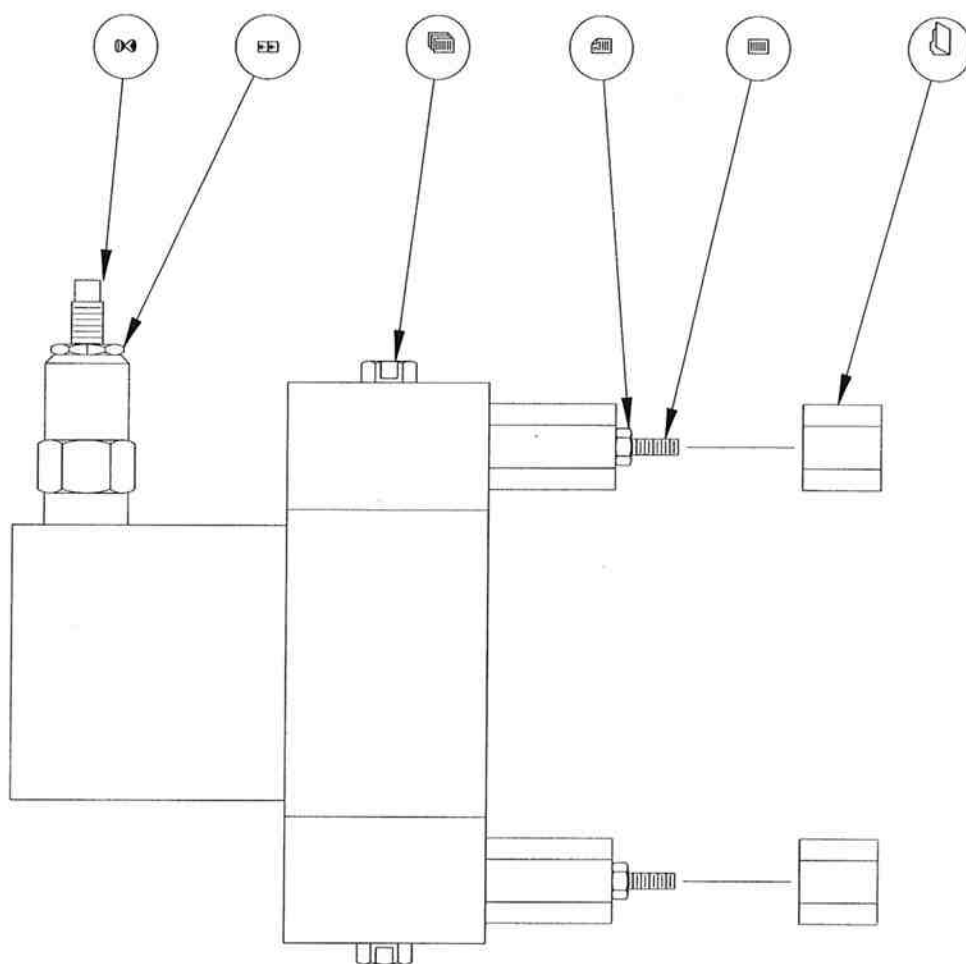
**FOLLOW LOCK OUT PROCEDURES BEFORE SERVICING: LOCK OUT POWER WITH PADLOCK FOR WHICH ONLY YOU HAVE THE KEY.**

#### Procedure for Setting Operational Pressure

The following procedure shall be used for setting the main relief valve and the directional control valve.

1. Check the wiring schematic provided either in the junction box or attached to the motor to verify wiring is correct for the voltage provided to the unit. Start the unit and verify the motor is running in a clockwise direction when viewed from the fan end (top). (if rotation is wrong, reverse two of the power lead connections to change motor direction.)
2. Observe the cleaning carriage. The carriage may or may not move in an extend or retract direction. It is not, however, of concern at this time.
3. To set the main relief valve, first remove the two hex head caps on the stems protruding out of the directional control valve body (see page 6-1A, item 1). After removing the two hex head caps, you will observe allen-socket head set screws with locknuts (items 2 & 3). Loosen the locknuts and turn the set screws all the way closed. At this point, no flow will be going through the hydraulic hoses.

**NOTE: Only tighten the set screws until the screw bottoms out. DO NOT OVER TORQUE or you may cause damage to the valve.**



### Operating Pressure Adjustment

6-1A

4. Observe the pressure reading on the pressure gauge. The gauge should read 1750 psi as a starting point. To adjust this pressure, locate the main relief valve

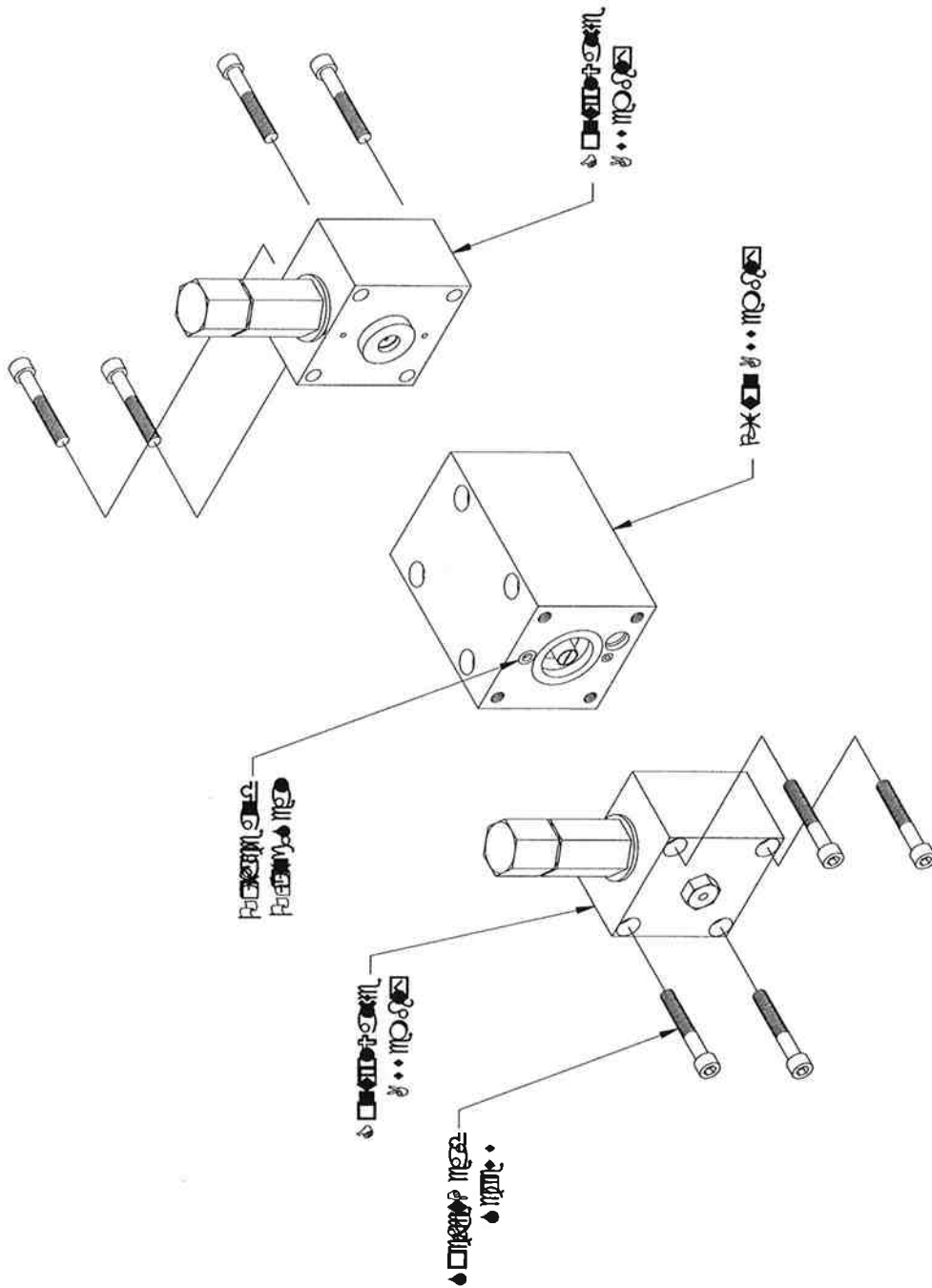
on the side of the manifold block. The main relief valve also has a locknut to hold the desired setting (see page 6-1a, items 5 & 6). Loosen the locknut and tighten or loosen the main relief valve set screw as required to bring the pressure reading on the gauge to the desired 1750 psi. (if necessary for proper operation, this pressure can be set higher, but should not exceed 2250 psi). Tighten the locknut while holding the set screw in place.

5. Return to the directional control valve set screws on the valve body and use the allen wrench to manually press in one of the actuating pistons of the valve (item 4). Then proceed with the adjustment of the valve on the opposite side of the depressed piston (item 3). Carefully unscrew the set screw counterclockwise for about 3-1/2 to 4 turns. Continue turning counterclockwise until the valve reverses. Open the valve an additional 1/4 turn and temporarily lock the set screw in position with the locknut. Now proceed to the opposite side and adjust the other set screw using the same procedure. When completed with adjustment, lock the set screw in place with the locknut.
6. Let the unit operate for several cycles to verify proper operation. Should the carriage stop at the end of its press or return stroke, adjust the directional control valve until the cylinder begins to move again. Continue the adjustment procedure until the carriage will cycle completely without any need for further fine tuning.
7. When adjustment is complete, lock the directional control valve set screws in place by tightening down the locknuts, replace the hex nut caps and shut the unit down. The hydraulic power supply and valve adjustments are now complete and the system is ready for operational use.

#### Directional Control Valve Does Not Function

Failure of the cleaning carriage to cycle may be due to a clogged orifice in the directional control valve as a result of dirty, unfiltered hydraulic oil. The following procedure should be used to clean the orifice. (See figure on page 6-2A.)

1. Remove the directional control valves by unscrewing the four screws. Carefully pull the side part from the main body so as to not damage the o-rings at the orifice interface.
2. Clean the orifice using a .4mm diameter drill bit or rod.
3. Clean and install the o-rings at the orifice interface. Place the control valve part carefully over the piston end and push it in place. Check that the o-rings are in position and install the screws, taking care that they are not overtightened.



Directional Control Valve

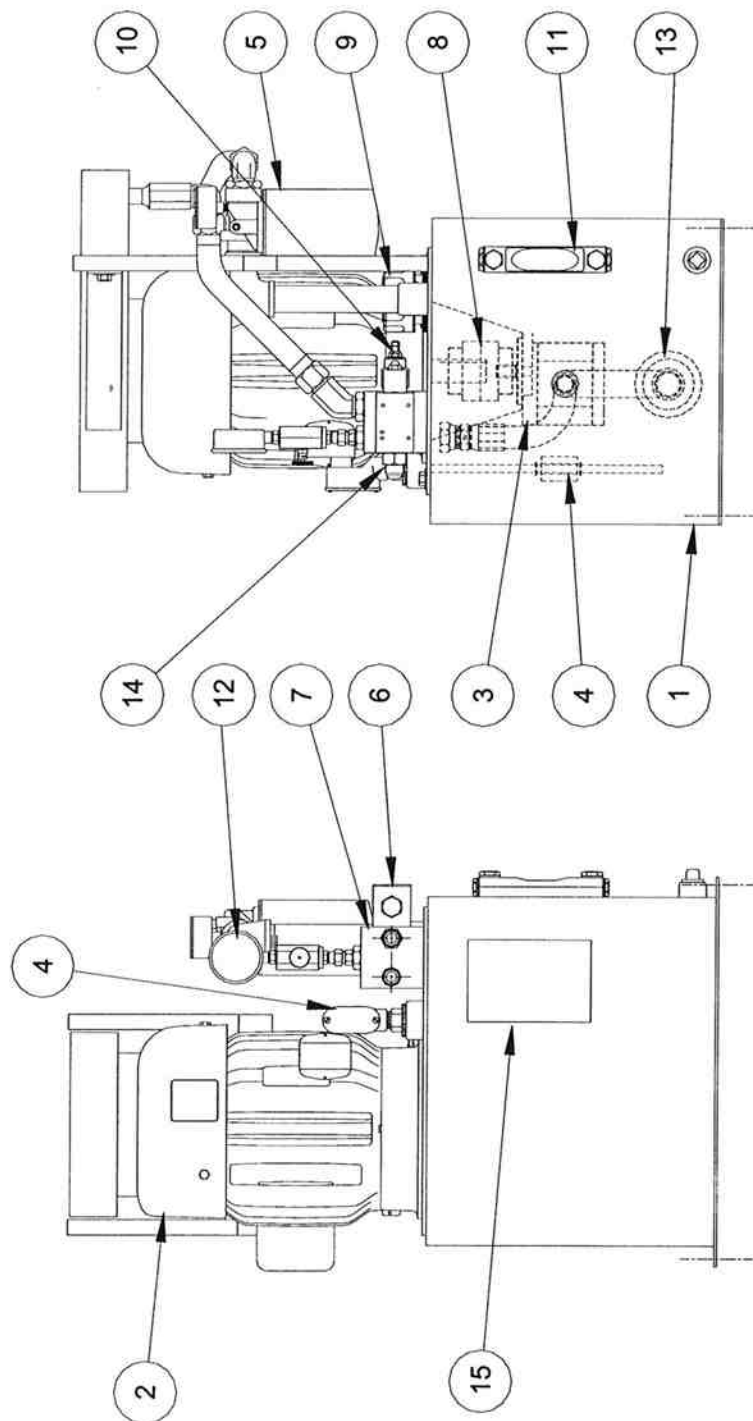
### Hydraulic Cylinder Removal

1. Remove the bolts on the top face of the ROMAG unit to expose the hydraulic cylinder.
2. Remove link pin at the rod end.
3. Disconnect hydraulic lines and cap all ports in both hydraulic lines and the hydraulic cylinder to prevent dirt contamination. Remove the clamp securing the cylinder to the frame. Then withdraw the hydraulic cylinder from the ROMAG unit.
4. Repair or replace hydraulic cylinder as required.
5. Reinsert the repaired/new hydraulic cylinder back into the unit.
6. Secure the hydraulic cylinder to the frame with the provided clamp.
7. Replace rod end/link pin connection. Replace hydraulic hose lines and cycle hydraulic system until all air is removed. Refill hydraulic cylinder with hydraulic oil if needed.

### Motor Repair (See page 6-3A & 6-3B.)

Should a motor failure occur, evidenced by high current power draw or erratic operation and assuming normal system operating pressures, the motor should be removed and checked out by an authorized Electrical Appliance Service Association (EASA) shop. Motor removal procedure:

1. Disconnect the electrical wiring to the motor and remove the electrical conduit.
2. Remove the four (4) bolts holding the motor adapter plate to the top of the hydraulic tank.
3. Lift the motor, hydraulic pump, and hydraulic lines vertically and support the assembly on blocking.
4. Remove the four (4) bolts attaching the motor adapter plate to the motor from the underside. Lift the motor vertically to disengage the flexible couplings.
5. Loosen the set screw on the flexible coupling half attached to the motor shaft, and remove.
6. To reinstall, reverse the above procedure, aligning the flexible coupling halves while lowering the motor into position.



Hydraulic Power Supply

6-3A

## HYDRAULIC POWER SUPPLY

### Model RMG-W

Item No.	Description
1	Oil Tank, volume about 10 gal.
2	Electric Motor 5 HP
3	Gear Pump
4	Oil Level/Temperature Switch
5	Return Oil Filter
6	Directional Control Valve
7	Manifold
8	Shaft-coupling
9	Oil Filler Breather
10	Main Relief Valve
11	Oil Level/Temperature Gauge
12	Pressure Gauge (0-3000 psig)
13	Suction Filter
14	Hydraulic Hoses couplings
15	Warning Label

Reference unit's project number, serial number and model number when ordering replacement parts.

See Hydraulic Power Unit Data in Section Nine of this Manual for component details.

## Hydraulic Pump Repair (See page 6-3A & 6-3B.)

Should a pump failure occur, the following procedure should be used to remove and repair or replace the hydraulic pump.

1. Disconnect the electrical wiring to the motor and remove the electrical conduit.
2. Remove the four (4) bolts holding the motor adapter plate to the top of the hydraulic tank.
3. Lift the motor, hydraulic pump and hydraulic lines vertically and support the assembly on blocking.
4. Disconnect the pump suction line (and suction filter) and pressure line from the hydraulic pump.
5. Remove the two (2) bolts attaching the hydraulic pump to the motor adapter plate through the pump adapter, and lower and remove the hydraulic pump. Remove the pump adapter plate.

**NOTE:**      **The rubber cushion between the flexible coupling halves is not attached to either half. Exercise care when removing the hydraulic pump.**

6. To reinstall, reverse the above procedure, aligning the flexible coupling halves while raising the pump into position.

### Oil Filter Replacement

The hydraulic filter is a 10 micron cartridge type. A new filter should be installed every 2500 hours of operation or twice a year (whichever comes first), and any time the hydraulic fluid is changed. This may vary depending on general cleanliness of the area in which the unit is installed, operating temperatures and care taken during replacement of hydraulic oil. The hydraulic fluid should be changed once a year or anytime it has been contaminated (see Lubrication Chart, page 5-3, for hydraulic fluid type).

The oil filter is located under the filler cap. It has a handle on the top for easy removal from the bowl and a helical spring to secure the element in it's location

### Cleaning Comb Replacement

The tools required for performing a comb replacement are the following:

- rubber mallet
- 5 mm allen wrench
- small phillips screwdriver
- thread locking fluid

**NOTE:** There are six different combs used on ROMAG Screens. Consult the section below to identify which comb(s) to be replaced.

The first step in the replacement process is to shut off and lock out the machinery. Consult your Safety Standard Operating Procedures and the Safety section of this IOM for guidelines on locking out the equipment before doing any work on the equipment. The next step is to identify which set of combs need replacing. After identifying the comb set, remove the two hex head cap screws securing the set to the comb support frame. Using the mallet, push the comb across the screen face until it is free of the comb support. When the half-moon, plastic locking pin is exposed push it down and out of the comb using the screwdriver. (These pins are only used for combs that are in the middle of the screen, that is if there are three or more sets of combs.) Use the mallet to push the comb through the screen until it can be removed by hand. Orient the new comb until its profile matches the other sets and insert its combs into the screen. It is necessary to make sure that each screen bar has a comb separating it from the next screen bar. When the comb is properly aligned and pushed into its required depth insert the half-moon locking pin and tap it flush. Tap the comb until the mounting holes are aligned with the holes in the support. If the tapped holes in the brass mounting rods have rotated, use the tip of the screwdriver to gently realign the hole. Place some thread locking fluid in the holes and insert the mounting screws. Do not over tighten the screw as it will damage the brass threads. If more than one set of combs needs to be replaced, it is recommended that adjacent sets are replaced one at a time.

#### Comb Identification

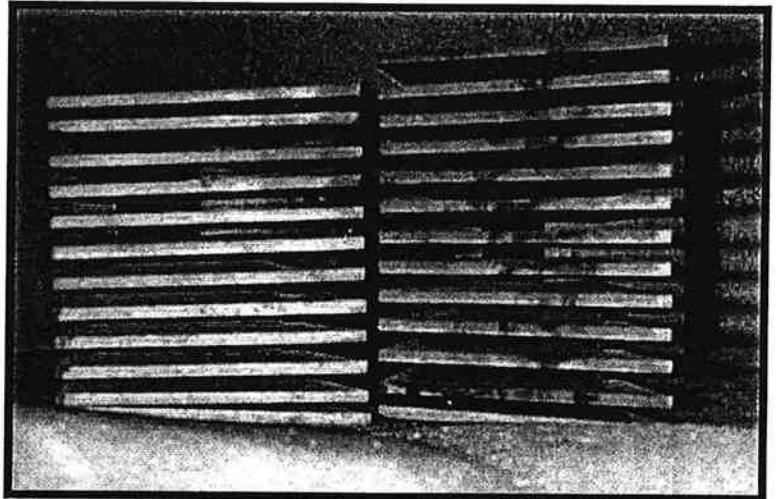
- Brass Combs on the down stream end of unit, there are two types:  
Solid - 13 tines and 12 tines
- Plastic Combs on the up stream end of unit, there are two types:  
Solid - 13 tines and 12 tines
- Plastic Combs in the middle of the unit (if applicable), there are two types:  
Hole w/half moon pin - 13 tines and 12 tines

Looking at the screen from the discharge side, if the screen pushes left, the top combs in each row will be 13 tines tall and the rest of the combs in that row will be 12 tines tall.

Looking at the screen from the discharge side, if the screen pushes right, the bottom combs in each row will be 13 tines tall and the rest of the combs in that row will be 12 tines tall.

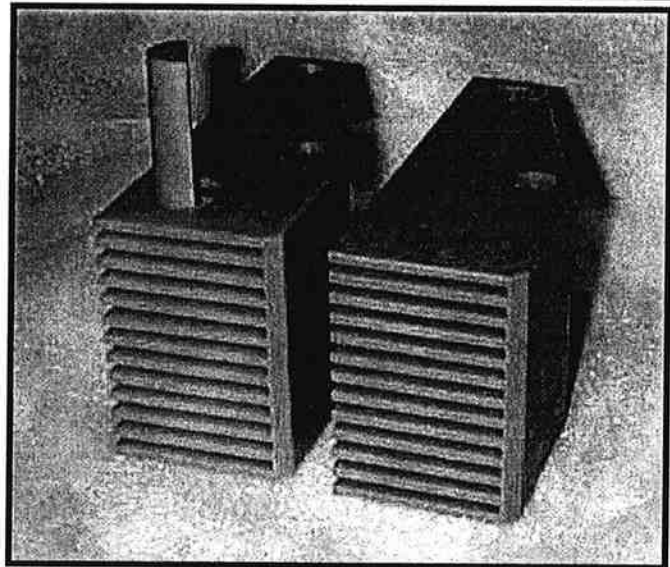
There are 6 different kinds of cleaning combs so be sure to know which type is needed before you begin this operation.

- Brass combs are only used at the end of the ROMAG Screen. The combs either have 12 or 13 tines.



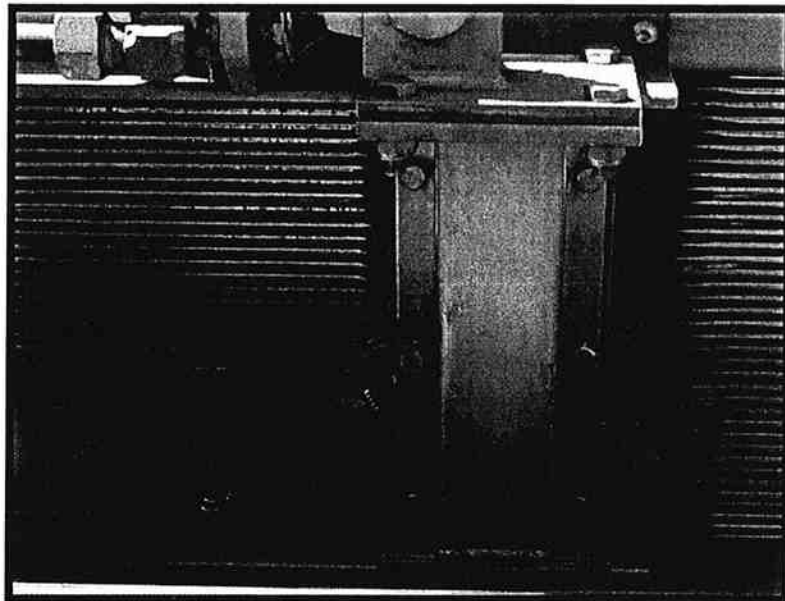
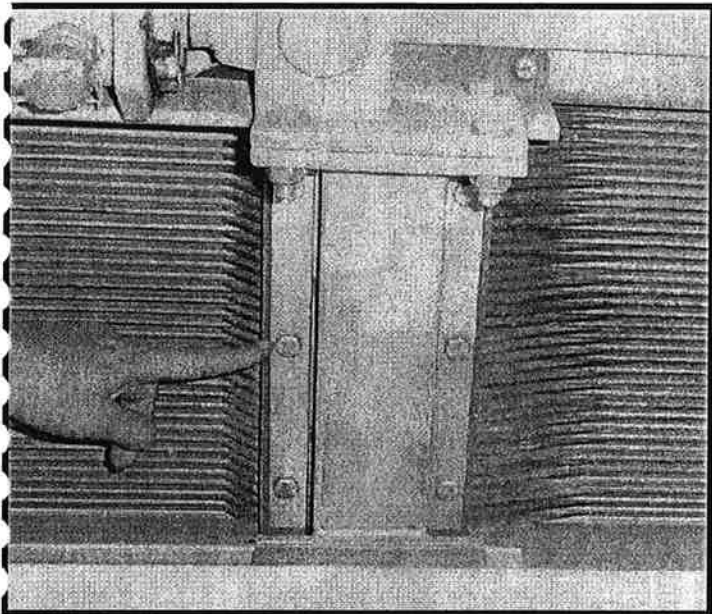
- Green plastic combs also come in 12 or 13 tines.

- Green plastic with half circle (moon) pins, also in 12 or 13 tines. The combs with pins are only used in the middle section of the screen as the pins will interfere with the debris take off fins at the end of the screen bars. This photo shows one of each type of comb.

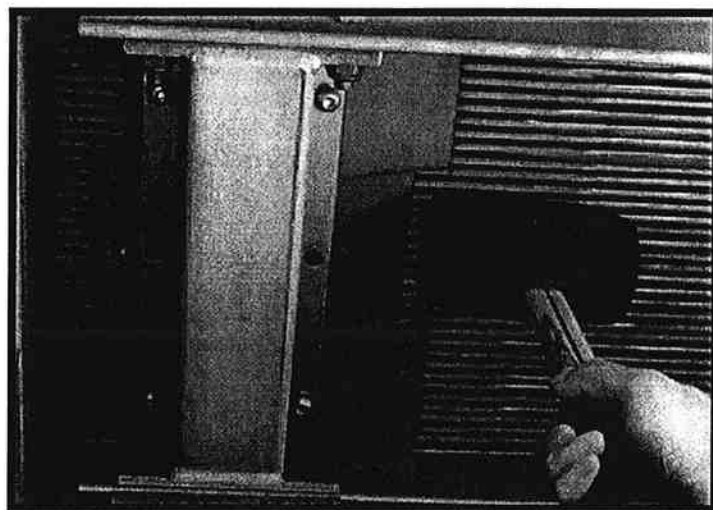


**To replace any green comb:**

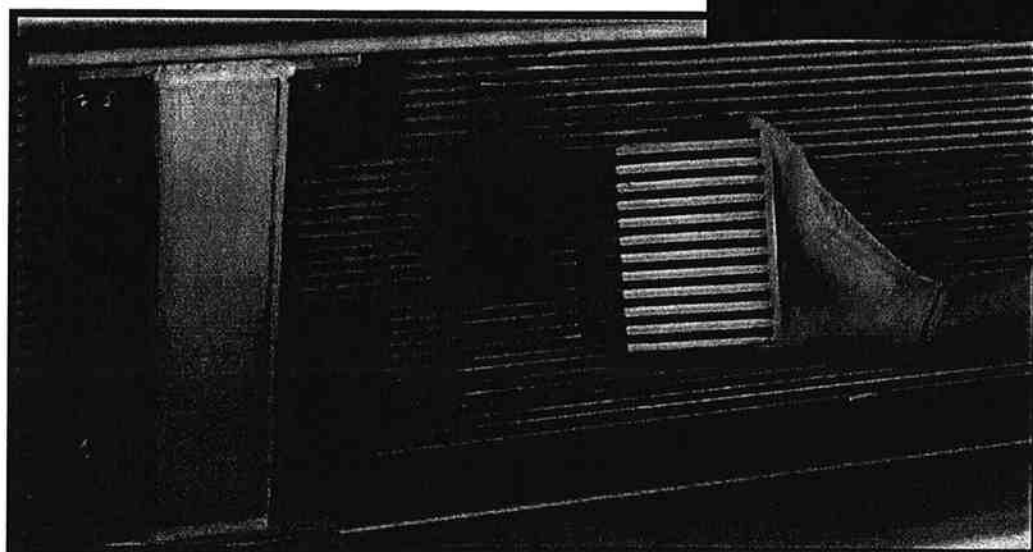
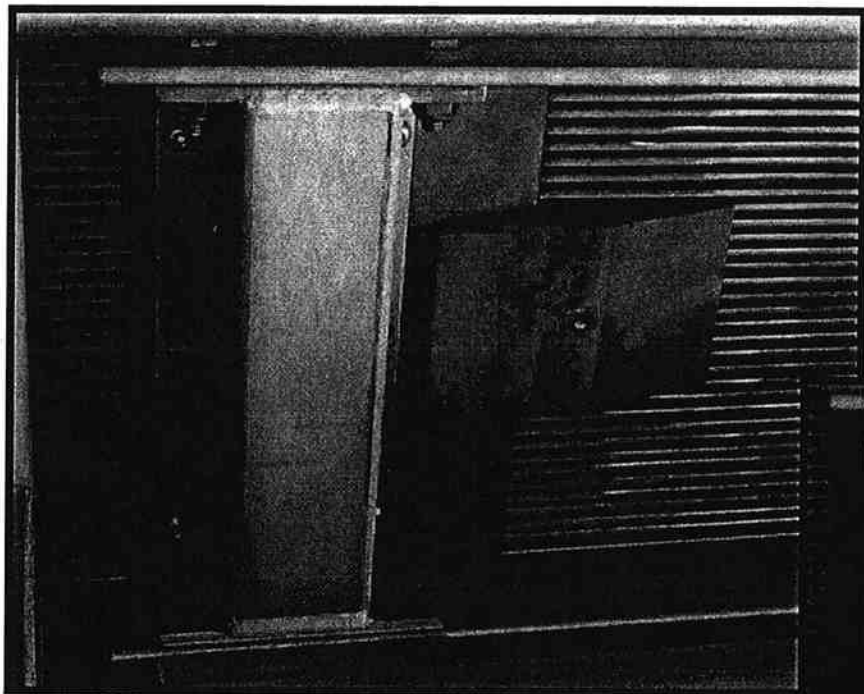
- Shut off and lock out the screen.
- Remove the 2 hex head cap screws securing the comb to the moving carriage. This is done from the back or rear of the screen.



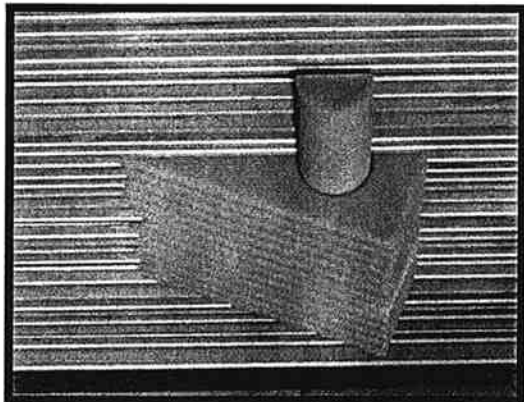
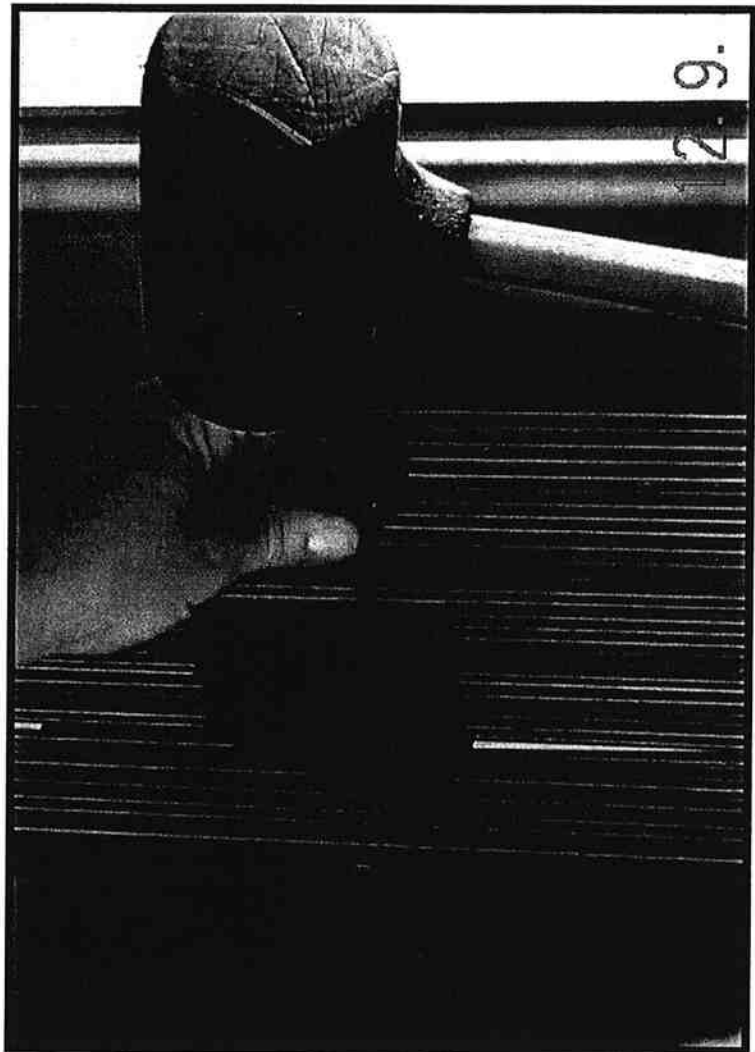
- Use a rubber mallet and gently tap the comb to be replaced forward or backward ALONG the bars until it clears the support frame.



Slide the comb along the bars until it is free of the frame and remove it.



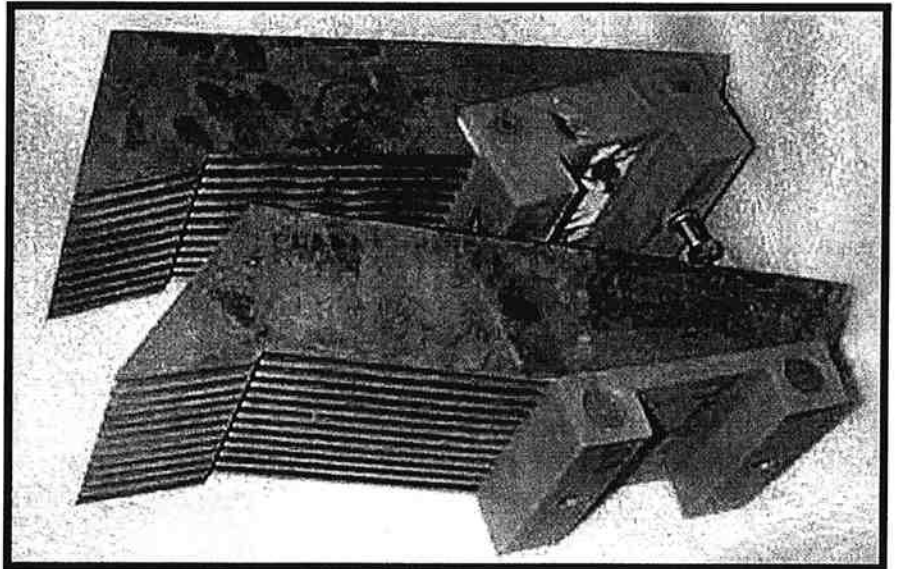
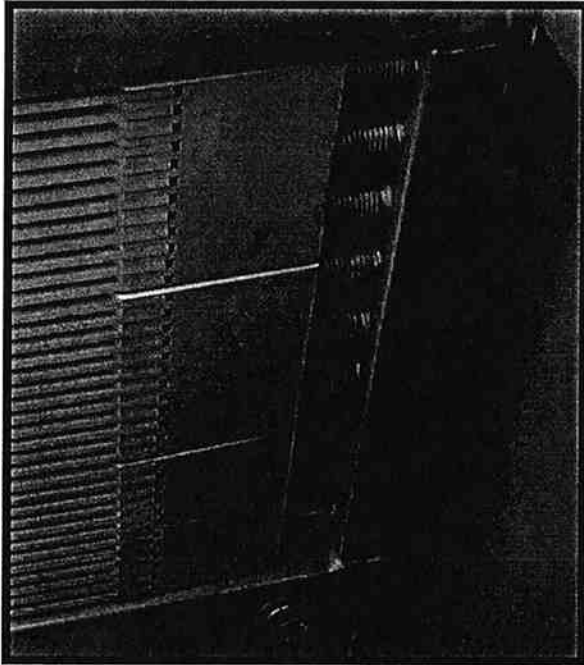
- If the screen has a locking pin, place a screwdriver on the top of the pin and with the rubber mallet, gently knock the pin down and out to free the comb. Then slide the comb out of the bars.



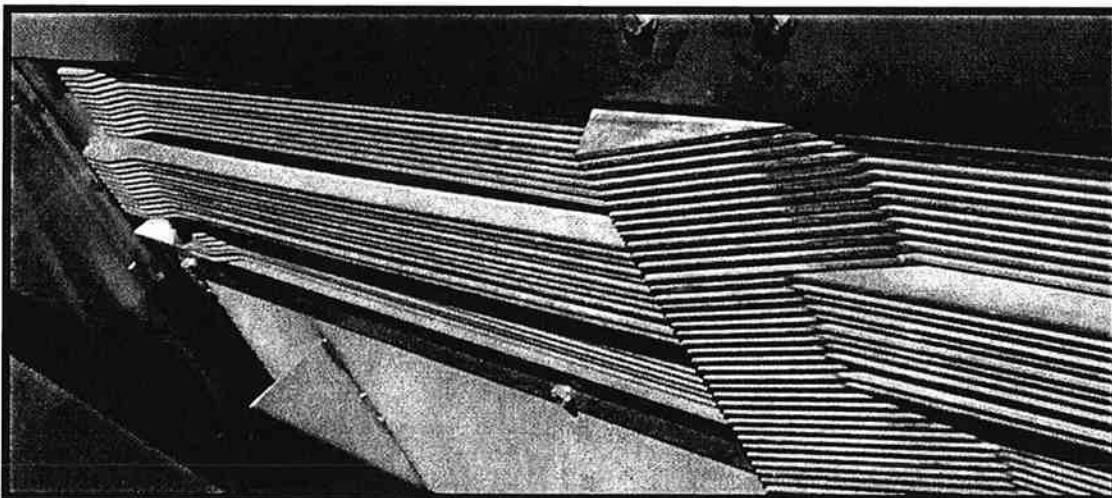
- Replace the comb with the one needing replacement and follow directions in reverse. Do not over tighten hex head screw.

### To replace any BRONZE comb:

- Shut off and lock out the screen..
- The Bronze combs recess about 1/2" around the cleaning carriage frame so it is necessary to loosen one module section of bars and push that section away from the rest of the bars. First loosen the tensioning end of the bars, shown on the left below.

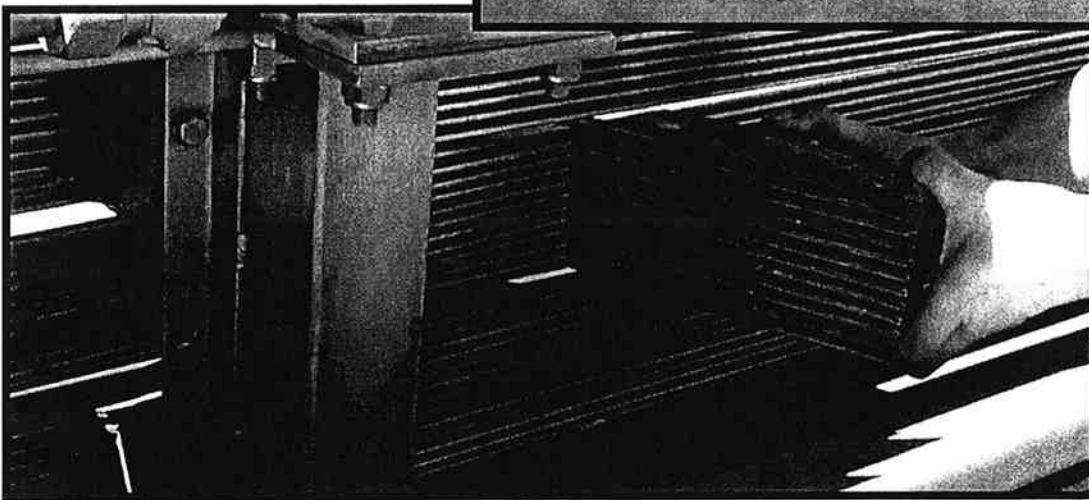
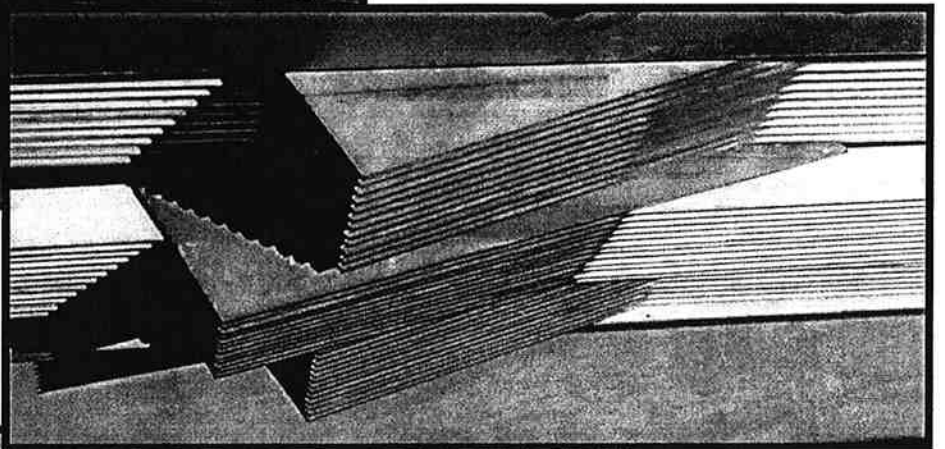
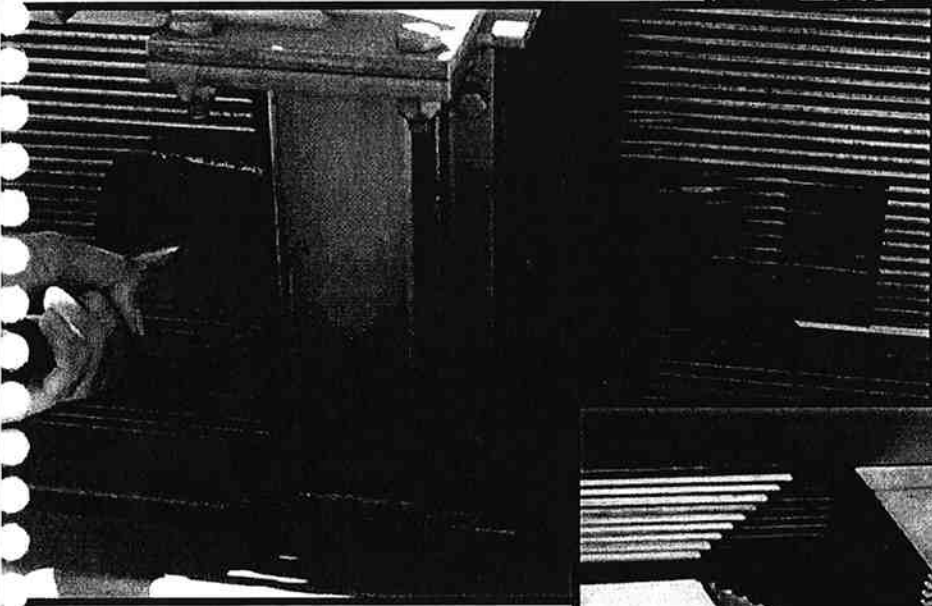
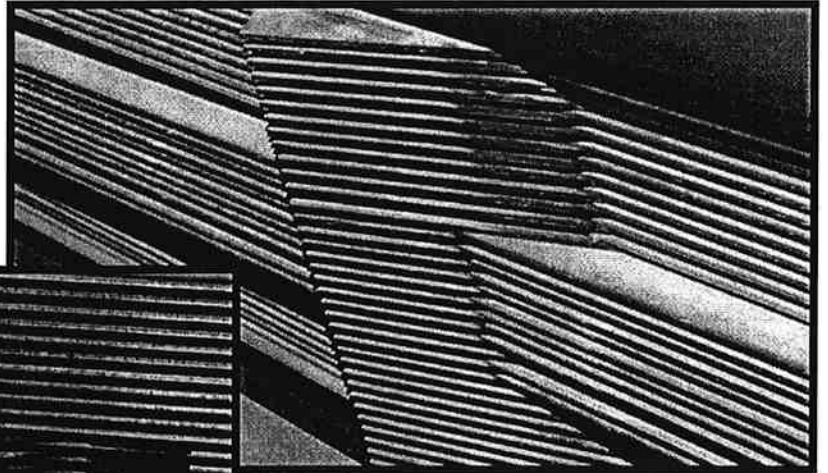


- Loosen the tensioning bolts as above and then push out the bars as shown below. Depending on where on the screen you are replacing a comb you may have to undo the bolts holding the bars to the frame on at the other end of the screen.

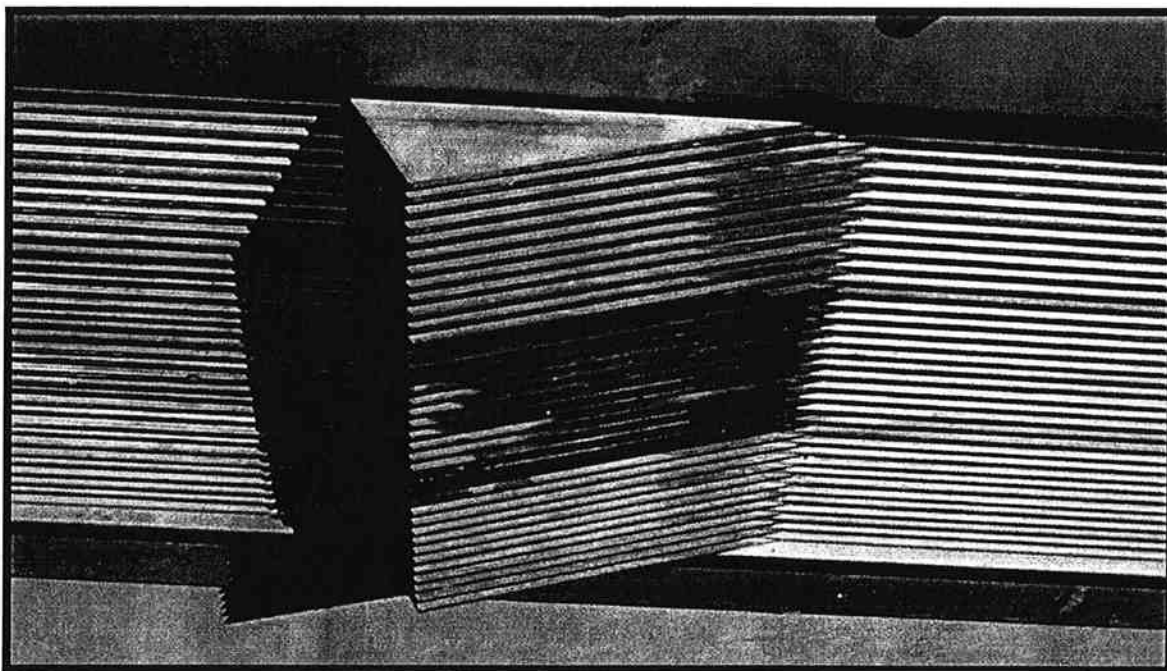


6-10

Pushing out the bar section  $\frac{1}{2}$  to 1.0" gives you room to slide the bronze comb over the frame. Tapping the comb with a rubber mallet will move the comb along the bars until it can be removed. A simple lubricant like WD40 can help.



Slide out the comb to be replaced and insert a new comb by following the steps in reverse. Do not over tighten bolts.



When finished the combs should align with the other combs on the screen. Replace the bar module sections and retention the tension bolts per the IOM to 34.5 Newton meters

#### Unit Cleaning

When the ROMAG unit is to be shut down for an extended length of time, the carriage assembly and bar racks should be hosed down thoroughly. If this is not done, the solids could dry out and set up, making removal somewhat difficult.

## **DANGER**

- **WHEN INSTALLING OR MAINTAINING THE ROMAG UNIT OR ASSOCIATED HARDWARE, BE SURE THAT ANY LIFTING EQUIPMENT IS OF SUFFICIENT CAPACITY BEFORE LIFTING OR MOVING THE ROMAG UNIT OR ASSOCIATED HARDWARE.**
- **MAKE SURE ANY ELECTRICAL CONNECTIONS ARE DONE BY QUALIFIED PERSONNEL AND IN ACCORDANCE WITH ALL APPLICABLE CODES AND REQUIREMENTS.**

- **DO NOT OPERATE A DAMAGED OR MALFUNCTIONING MECHANISM UNTIL NECESSARY ADJUSTMENTS OR REPAIRS HAVE BEEN MADE.**
- **OVERLOAD AND/OR SAFETY SWITCHES ARE EMERGENCY DEVICES. DO NOT USE THE OVERLOAD OR SAFETY SWITCHES TO STOP THE MECHANISM DURING NORMAL OPERATION.**
- **CONTACT WITH OR EXPOSURE TO MATERIAL PROCESSED OR LUBRICANTS AND OTHER FLUIDS MAY CAUSE INFECTION OR ADVERSE REACTIONS. REPORT ANY CUTS, INJURIES OR EXPOSURE TO YOUR SUPERVISOR IMMEDIATELY AND SEEK APPROPRIATE MEDICAL ATTENTION.**
- **THIS PRODUCT HAS BEEN SUPPLIED WITH WARNING LABELS, SHOULD THEY BECOME DAMAGED, REMOVED OR ILLEGIBLE, PLEASE CONTACT PARKSON CORPORATION FOR NO-COST REPLACEMENT LABELS.**
- **WARNING LABEL PART NUMBERS FOR THIS PRODUCT IS 3824-041.**

**CALL TOLL FREE: 1-800-249-2140 OR  
 FAX: (847) 837-4996  
 PARKSON CORPORATION  
 HYCOR® CORPORATION  
 ATTENTION: PARTS DEPARTMENT  
 562 BUNKER COURT  
 VERNON HILLS, IL 60061-1831**



## SECTION SEVEN

### Hycor® ROMAG RMG-W Unit TROUBLE-SHOOTING GUIDE



# DANGER



**REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.**

PROBLEM	PROBABLE CAUSE	REMEDY
NON-CYCLING CLEANING CARRIAGE	Screen jammed.	Clear obstruction.
	Extremely cold temperature.	Add oil heater to hydraulic reservoir.
	Motor heater overload.	Investigate/repair fault conditions  Check fuse or circuit breakers.
	Low oil level.	Replace hydraulic oil as required.
CLOGGED ORIFICE (Directional valve)	Dirty or unfiltered oil.	Clean orifice and change oil. (Always replace oil filter when changing oil - refer to Section Six for instructions.)
LEAKING HYDRAULIC FLUID	Cracked hoses or loose fittings.	Replace hoses and tighten fittings. NOTE: If seepage persists, replace hydraulic fittings.
HIGH OIL TEMPERATURE	Screen Jammed	Clear Obstruction
	Relief Pressure too low	Increase pressure on main relief valve (2250 psi max)



### MOTOR

Since any number of reasons could be responsible for the failure, the following guide lists usual conditions that can lead to difficulties with a motor. Should there be any indication of a premature failure, care must be taken to make certain that:

1. The original motor selection was the proper one.
2. The motor was installed correctly, particularly the electrical connections.
3. The power supply was correct.
4. The motor was of the proper size (speed and horsepower) to do the job.

Verify the above conditions have been completed. Use of the following guide in pinpointing the difficulty will lead to long service life and complete satisfaction.

## TROUBLE-SHOOTING GUIDE (cont'd.)

PROBLEM	PROBABLE CAUSE	REMEDY
MOTOR FAILS TO START	Blown Fuses.	Replace fuses. Should be at least 125% of nameplate amperes.
	Overload Trips.	Check and reset overload in starter.
	Improper power supply.	Check to see that power supplied agrees with motor nameplate and load factor.
	Improper line connections.	Check connections with diagram supplied with motor.
	Open circuit in winding.	Indicated by humming sound when starter is closed. Check for loose wiring connections.
	Mechanical failure.	Check to see if motor and drive turn freely. Check bearings and lubrication.
	Short circuited stator.	Indicated by blown fuses, tripped circuit breakers or heaters. Motor must be rewound.
	If 3 phase, one phase may be open.	Check lines for open phase.
	Low motor voltage.	See that nameplate voltage is maintained. Check connection.

## TROUBLE-SHOOTING GUIDE (cont'd.)

PROBLEM	PROBABLE CAUSE	REMEDY
MOTOR RUNS AND THEN STOPS	Power failure.	Check for loose connections to line, to fuses and to control
MOTOR DOES NOT COME UP TO SPEED	Voltage too low at motor terminals because of line drop.	Verify proper electrical wire size for power draw.
	Open primary circuit.	Locate fault with testing device and repair.
MOTOR TAKES TOO LONG TO ACCELERATE	Poor circuit.	Check for high resistance.
	Applied voltage too low.	Get power company to increase power tap.
WRONG ROTATION	Wrong sequence of phases.	Reverse connections at motor or at switchboard.
MOTOR OVERHEATS WHILE RUNNING UNDER LOAD	Frame or bracket vents may be clogged with dirt and prevent proper ventilation of motor.	Open vent holes and check for a continuous stream of air from the motor.
	Motor may have one phase open.	Check for voltage and make sure that all leads are well connected.
	Unbalanced terminal voltage.	Check for faulty leads, connections and transformers.
	Shorted stator.	Rewind or replace stator.

## TROUBLE-SHOOTING GUIDE (cont'd.)

PROBLEM	PROBABLE CAUSE	REMEDY
MOTOR OVERHEATS WHILE RUNNING UNDER LOAD (cont'd.)	Faulty connection.	Indicated by high resistance.
	High voltage. Exceeds +10% of nameplate volts.	Check terminals of motor with a voltmeter.
	Low voltage. Exceeds -10% of nameplate volts.	Check terminals of motor with a voltmeter.
	Rotor rubs stator bore.	If not poor machining on brackets, replace worn bearings.
MOTOR VIBRATES AFTER CONNECTIONS HAVE BEEN MADE	Motor misaligned.	Realign.
	Weak support.	Strengthen base.
	Coupling out of balance.	Balance coupling.
	Defective bearing.	Replace bearing.
	Bearings not in line.	Line up properly.
	Excessive end play.	Adjust bearing or add washer.
UNBALANCED LINE CURRENT ON POLYPHASE MOTORS DURING NORMAL OPERATION	Unequal terminal volts.	Check leads and connections.
SCRAPING NOISE	Fan rubbing.	Remove interference.

## TROUBLE-SHOOTING GUIDE (cont'd.)

PROBLEM	PROBABLE CAUSE	REMEDY
NOISY OPERATIONS	Air gap not uniform.	Check and correct bracket or bearing.
	Rotor unbalance.	Rebalance.
HOT BEARINGS GENERAL	Insufficient grease.	Maintain proper quantity of grease in bearing.
	Deterioration of grease or lubricant contaminated.	Remove old grease, wash bearings thoroughly in kerosene and replace with new grease.
	Excess lubricant.	Reduce quantity of grease, bearing should not be more than 1/2 filled.
	Overloaded bearing.	Check alignment, side & end thrust.
	Badly worn bearing.	Replace bearing.
	Broken ball or rough races.	Replace bearing, first clean housing thoroughly.
	Bent or sprung shaft.	Straighten or replace shaft.
	Misalignment.	Correct by alignment of drive.

## **SECTION EIGHT**

### **Hycor® ROMAG RMG-W Unit REPLACEMENT PARTS**



# **DANGER**



**REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.**

**THIS PRODUCT HAS BEEN SUPPLIED WITH WARNING LABELS, SHOULD THEY BECOME DAMAGED, REMOVED OR ILLEGIBLE, PLEASE CONTACT PARKSON CORPORATION, FOR NO-COST REPLACEMENT LABELS.**

Replacement parts can be ordered either through your Hycor Products Representative or by contacting the Hycor Products Parts Coordinator toll free at **1-800-249-2140**.

Please have the unit's project number, serial number and model number as shown on the front cover, available. This will ensure the accuracy of the part identification.

## Replacement Parts List

Hycor® ROMAG Unit  
Model RMG-W

**NOTE:** Please give the project number (580112), and serial numbers (58011202 and 58011203) and model number (RMG0908W) when ordering replacement parts. This will ensure accurate part identification.

<u>Description</u>	<u>Qty. Per Unit</u>	<u>Part No.</u>
Motor, 5 HP, 230/460, 3 Ph, 60 Hz	1	3075-333
Level / Temp Switch	1	3654-008XP
Oil Level Indicator	1	3466-007
Hydraulic Hose	4	3442-062
Directional Control Valve	1	3443-005
Pressure Gauge	1	3444-022
Oil Filter	1	3468-022
Hydraulic Cylinder Packing Set	1 set	Consult Parkson
Hydraulic Cylinder Link Bearing	2	Consult Parkson
Hydraulic Cylinder	1	3451-018
Gear Pump	1	3469-011
Suction Filter	1	3448-008
Shaft-Coupling	1	3452-013
Main Relief Valve	1	3757-008
Plastic Cleaning Comb (12 tines)	16	3487-003
Plastic Cleaning Comb (13 tines)	2	3487-005
Bronze Cleaning Comb (12 tines)	8	3487-004
Bronze Cleaning Comb (13 tines)	1	3487-006
Plastic Cleaning Comb (w/hole -12 tines)	8	3487-007
Plastic Cleaning Comb (w/hole -13 tines)	1	3487-008

## **SECTION NINE**

Hycor® ROMAG RMG-W Unit  
COMPONENT DATA



**DANGER**



**REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE  
PROCEEDING.**



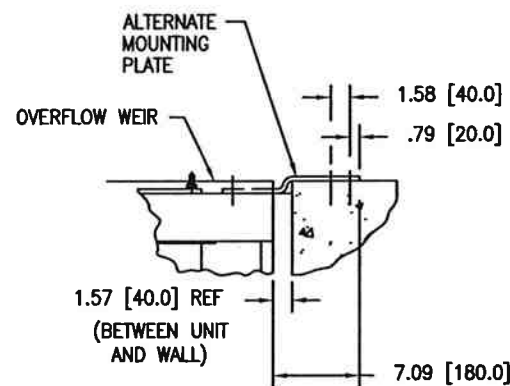
## SECTION TEN

Hycor® ROMAG RMG-W Unit  
DRAWINGS

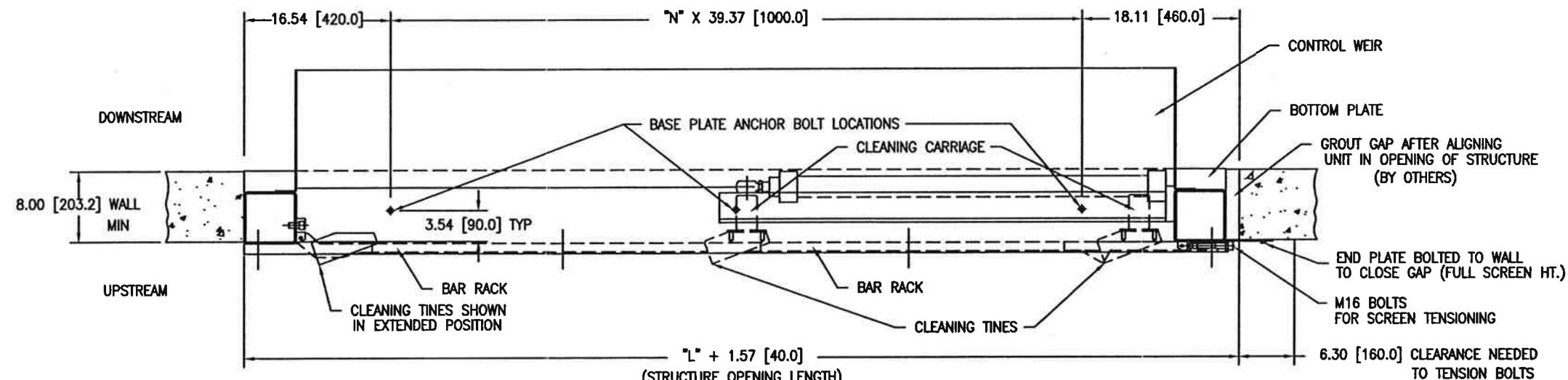


**REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.**

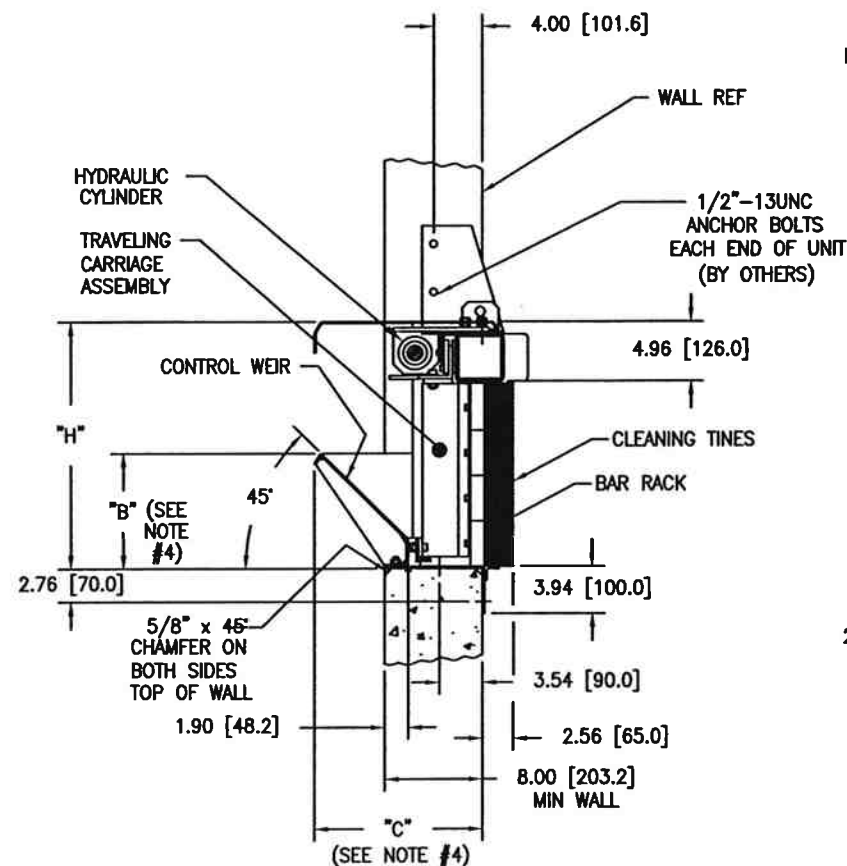




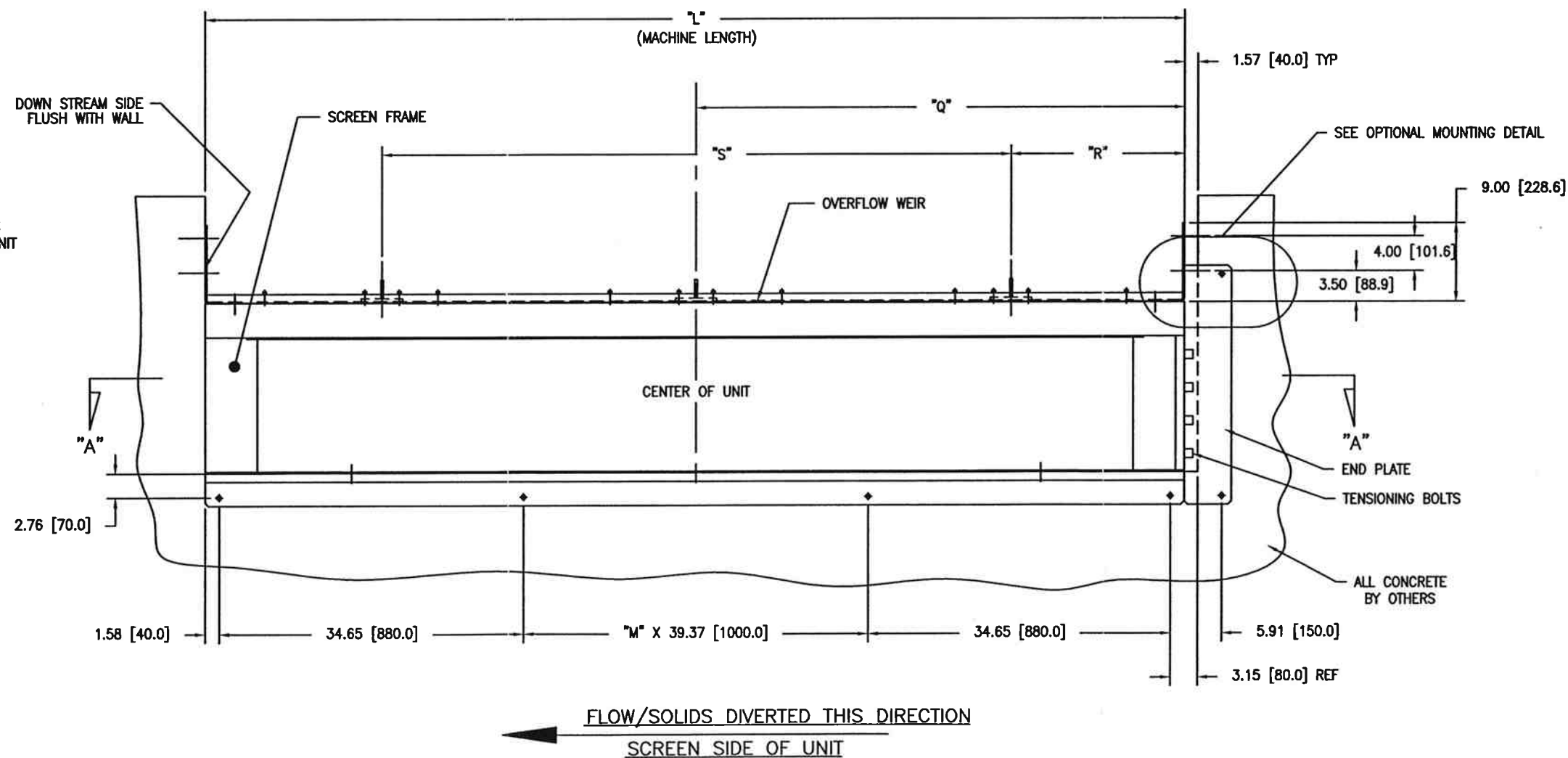
OPTIONAL MOUNTING DETAIL  
TYPICAL EACH SIDE



SECTION VIEW "A"-"A"



END VIEW



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By \_\_\_\_\_ Date \_\_\_\_\_

REV	DESCRIPTION	DATE

REFERENCE INFORMATION  
REV DATE: 06/28/01

PROJECT NAME

DRAWN BY  
EBC  
CHECKED BY  
WWW  
SCALE  
1/16" = 1"

DATE  
06/28/01  
DATE  
06/28/01

TITLE  
RMG \_\_\_\_\_ W  
HYCOR® ROMAG® SCREEN UNIT  
ELEVATIONS

DRAWING NO

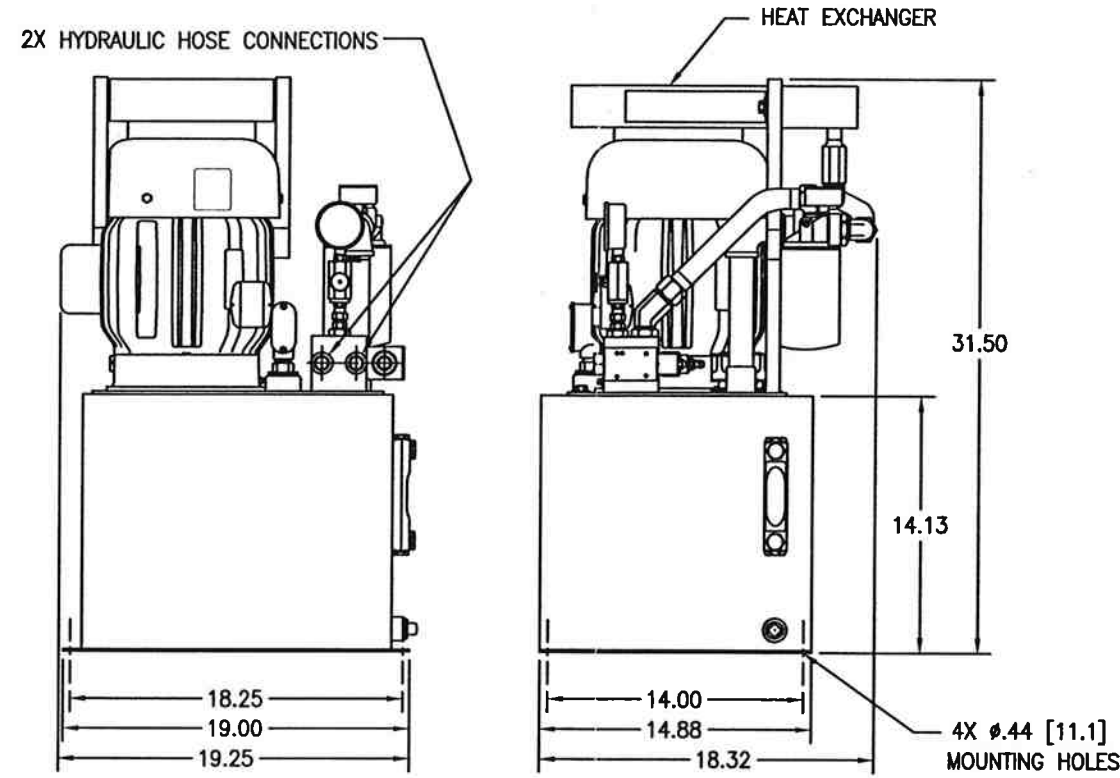
REV

SHEET 1 OF 3

1111

NOTE:

1. ALL 304L STAINLESS STEEL CONSTRUCTION EXCEPT FOR HYDRAULIC POWER UNIT, CLEANING TINES, AND SLIDE BLOCKS ON CARRIAGE ASSEMBLY.
2. HYDRAULIC POWER UNIT (ELECTRICAL CONTROLS NOT INCLUDED):
  - A. MOTOR: 5 HP [3.75 kW], 1800 RPM, 230/460/3/60, "DIRTY DUTY".
  - B. OIL RESERVOIR: 10 GALLONS.
3. ANCHORAGE AND DESIGN OF BRACING IS SITE SPECIFIC, CONSULT FACTORY FOR SITE SPECIFIC REQUIREMENTS.  
SCREENS WITH LENGTHS 2-5 HAVE (1) ONE BRACING POINT.  
SCREENS WITH LENGTHS 6-8 HAVE (2) TWO BRACING POINTS.
4. DIMENSIONS "B" AND "C" VARY WITH FLOW---CONTACT FACTORY FOR APPLICATION SPECIFIC DIMENSIONS.
5. WEIGHT: (SEE TABLE)
6. DIMENSIONS ARE GIVEN IN INCHES [MILLIMETERS], (FEET WHERE SHOWN).
7. \_\_\_\_ UNIT(S) TO BE SUPPLIED.
8. \_\_\_\_ MGD PEAK CSO FLOW.
9. FOR PROPER INSTALLATION, CONCRETE MUST BE LEVEL, FLAT, AND PERPENDICULAR IN ALL DIMENSIONS.
10. AN E-STOP IS PROVIDED TO BE MOUNTED BY CONTRACTOR AT AGREED UPON LOCATION.
11. IF MULTIPLE SCREENS ARE PLACED ON A COMMON WALL, THEY SHOULD BE SEPARATED BY A MINIMUM OF 1'-0". CONSULT FACTORY FOR SCREENINGS SUMP BAFFLE.
12. THE HYDRAULIC POWER PACK SHOULD IDEALLY BE MOUNTED INDOORS AND BE PROTECTED FROM FREEZING AND THE OUTDOOR ELEMENTS.



HYDRAULIC POWER UNIT

WEIGHT: 225 LBS

NUMBER OF MODULES	WEIGHT LBS [KG] (WITHOUT POWER PACK)						
	LENGTH						
	2	3	4	5	6	7	8
2	673 [305]	717 [325]	1125 [510]	1301 [590]	1544 [700]	1731 [785]	1863 [845]
3	761 [345]	1036 [470]	1257 [570]	1455 [660]	1709 [775]	1918 [870]	2117 [960]
4	838 [380]	1147 [520]	1389 [630]	1610 [730]	1885 [855]	2106 [955]	2315 [1050]
5	926 [420]	1257 [570]	1510 [685]	1753 [975]	2051 [930]	2293 [1040]	2525 [1145]
6	1014 [460]	1356 [615]	1643 [745]	1852 [840]	2216 [1005]	2492 [1130]	2734 [1240]
7	1091 [495]	1466 [665]	1775 [805]	2051 [930]	2381 [1080]	2668 [1210]	2944 [1335]
8	1180 [535]	1577 [715]	1896 [860]	2194 [995]	2558 [1160]	3043 [1380]	3142 [1425]
9	1268 [575]	1687 [765]	2018 [915]	2337 [1060]	2734 [1240]	3043 [1380]	3341 [1515]
10	1356 [615]	1797 [815]	2139 [970]	2481 [1125]	2911 [1320]	3219 [1460]	3550 [1610]
11	1444 [655]	1907 [865]	2260 [1025]	2624 [1190]	3087 [1400]	3396 [1540]	3760 [1705]
12	1532 [695]	2018 [915]	2381 [1080]	2767 [1255]	3263 [1480]	3572 [1620]	3969 [1800]

NUMBER OF MODULES	H	SCREEN LENGTH DESIGNATION	MACHINE LENGTH L	STRUCTURE OPENING LENGTH L + 1.57 [40.0]	M	N	Q	R	S
2	13.03 [331.0]	2	111.81 [2840.0] (9.32')	113.38 [2880.0] (9.45')	1 X 39.37 [1000.0]	2 X 39.37 [1000.0]	55.91 [1420]	-	-
3	16.81 [427.0]	3	151.18 [3840.0] (12.60')	152.75 [3880.0] (12.73')	2 X 39.37 [1000.0]	3 X 39.37 [1000.0]	75.59 [1920]	-	-
4	20.59 [523.0]	4	190.55 [4840.0] (15.88')	192.12 [4880.0] (16.01')	3 X 39.37 [1000.0]	4 X 39.37 [1000.0]	95.28 [2420]	-	-
5	24.37 [619.0]	5	229.92 [5840.0] (19.08')	231.49 [5880.0] (19.29')	4 X 39.37 [1000.0]	5 X 39.37 [1000.0]	114.96 [2920]	-	-
6	28.15 [715.0]	6	269.29 [6840.0] (22.44')	270.87 [6880.0] (22.57')	5 X 39.37 [1000.0]	6 X 39.37 [1000.0]		95.28 [2420]	78.74 [2000]
7	31.93 [811.0]	7	308.66 [7840.0] (25.72')	310.23 [7880.0] (25.85')	6 X 39.37 [1000.0]	7 X 39.37 [1000.0]		114.96 [2920]	78.74 [2000]
8	35.71 [907.0]	8	348.03 [8840.0] (29.00')	349.60 [8880.0] (29.13')	7 X 39.37 [1000.0]	8 X 39.37 [1000.0]		114.96 [2920]	118.11 [3000]
9	39.60 [1006]								
10	43.38 [1102]								
11	47.16 [1198]								
12	50.94 [1294]								

ROMAG SCREEN MODEL NUMBER: RMG

BAR SPACING OF 4mm

SCREEN LENGTH DESIGNATIONS (FROM TABLE)

NUMBER OF MODULES (FROM TABLE)

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By \_\_\_\_\_ Date \_\_\_\_\_

REV

DESCRIPTION

DATE

REFERENCE INFORMATION

REV DATE: 06/28/01

PROJECT NAME

DRAWN BY

EBC

DATE

06/28/01

CHECKED BY

WWW

DATE

06/28/01

SCALE

3/32" = 1"

TITLE

RMG \_\_\_\_\_ W  
HYCOR® ROMAG® SCREEN UNIT  
DIMENSIONAL DATA & HYDRAULIC UNIT

DRAWING NO

REV

SHEET 2 OF 3

1112

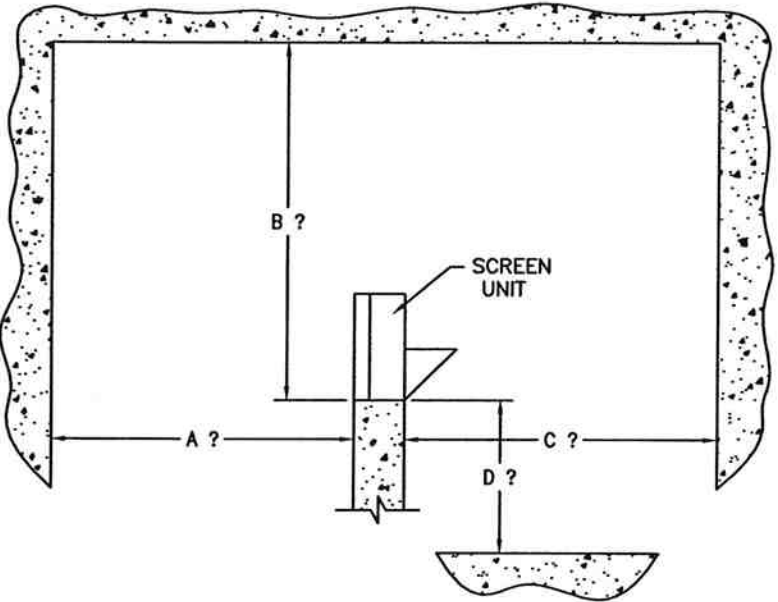
ROMAG SCREEN MODEL RMG ANCHOR BOLTS

SCREEN LENGTH (METERS)		2	3	4	5	6	7	8
MODULES	2-12	13	15	17	19	21	23	25

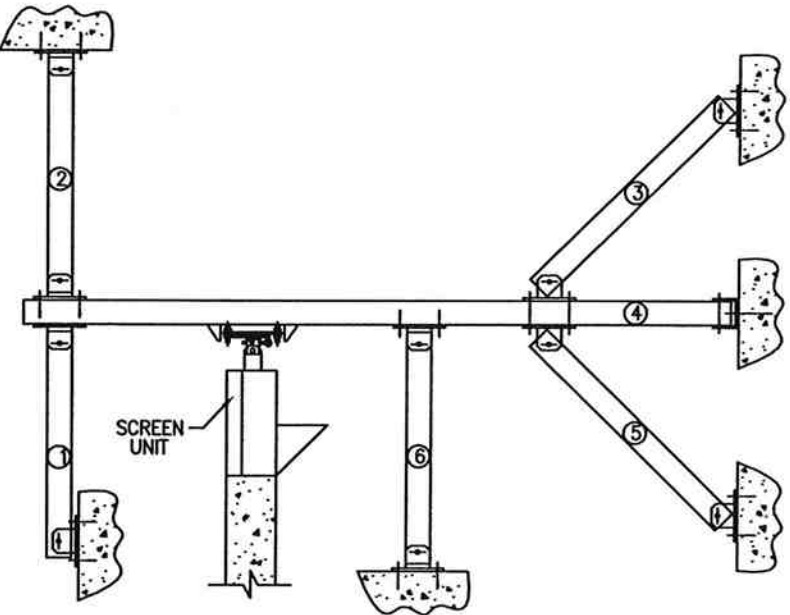
- DOES NOT INCLUDE ANCHORS FOR BRACING  
- PRE DRILLED HOLES ARE 1/2" DIAMETER

NOTE:

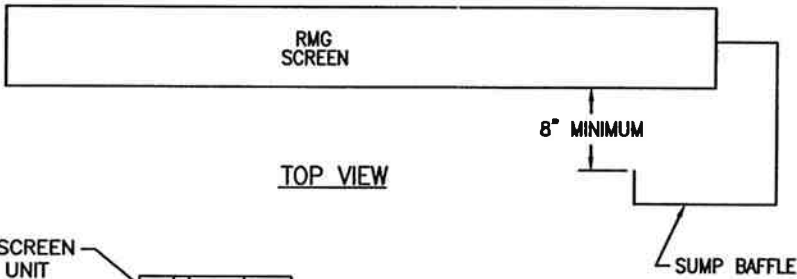
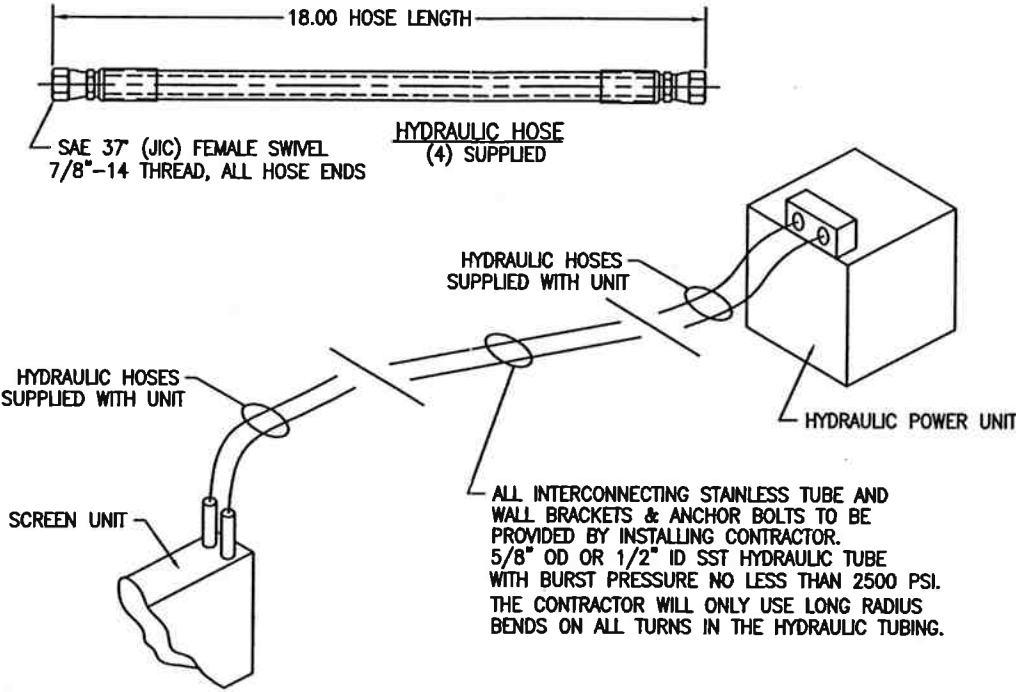
1. THE BRACING OF THE ROMAG SCREEN MODEL RSW IS DEPENDENT ON THE CHAMBER OR SITE. IT IS IMPORTANT TO BRACE THE SCREEN HORIZONTALLY AND VERTICALLY.
2. THE BRACING OPTIONS SHOWN FAR LEFT BOTTOM SHOW MANY VARIOUS BRACING CONFIGURATIONS.
3. ALL MATERIALS ARE MADE FROM 304 SST, 7 GA. SQUARE TUBING. ONCE THE DIMENSIONS TO NEAREST WALLS ARE KNOWN, WE CAN RECOMMEND A SUITABLE BRACING DESIGN.



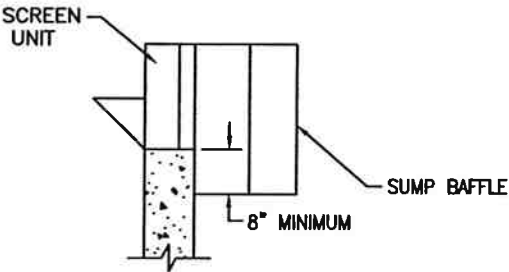
DIMENSIONS REQUIRED TO DETERMINE BRACING



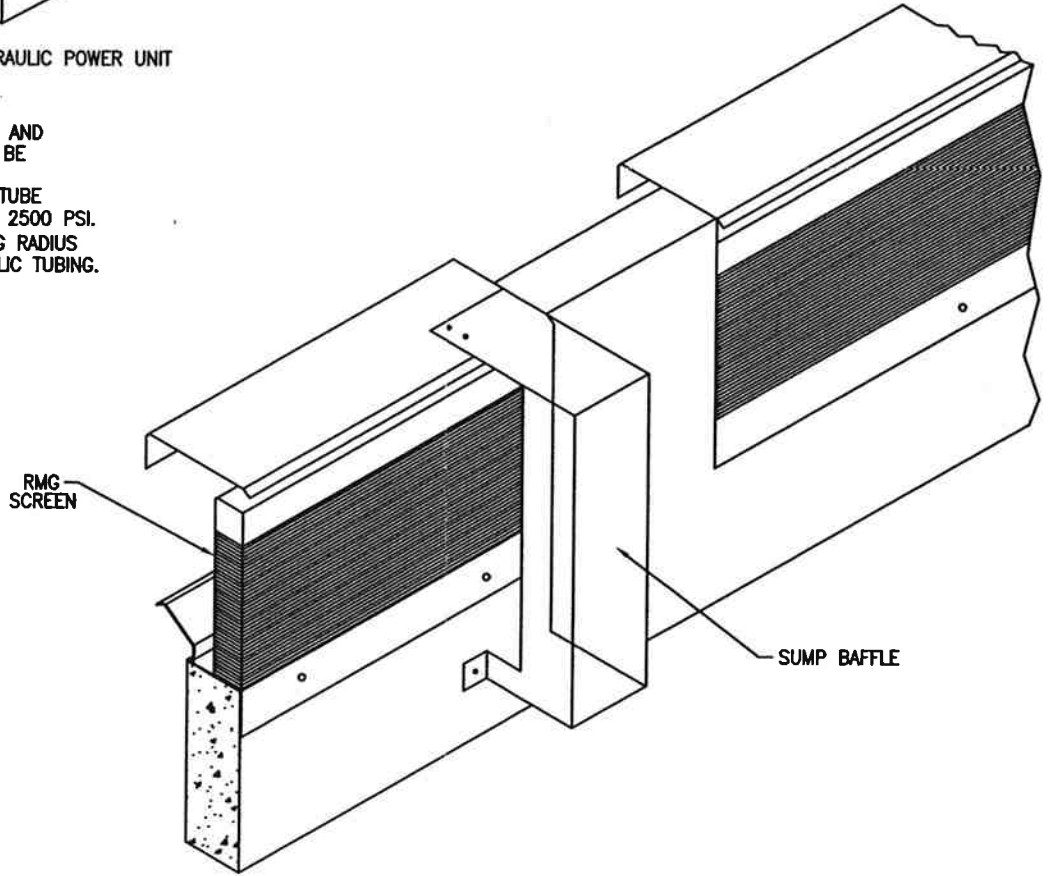
BRACING OPTIONS



TOP VIEW



END VIEW



SUMP BAFFLE DETAIL

FOR MULTIPLE SCREENS ON A COMMON WALL, A SCREENINGS SUMP BAFFLE IS RECOMMENDED AS SHOWN ABOVE. THIS CAN BE MADE OF STAINLESS STEEL OR CONCRETE.

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By \_\_\_\_\_ Date \_\_\_\_\_

REV	DESCRIPTION	DATE

REFERENCE INFORMATION  
REV DATE: 06/28/01

PROJECT NAME

DRAWN BY  
EBC  
CHECKED BY  
WWW  
SCALE  
NONE

DATE  
06/28/01  
DATE  
06/28/01  
TITLE  
RMG \_\_\_\_\_ W  
HYCOR® ROMAG® SCREEN UNIT  
ROMAG MISCELLANEOUS DETAILS  
DRAWING NO  
REV  
SHEET 3 OF 3

**Appendix D**  
**Cost Estimate Documentation**

---



## Cost Estimate Summary of Technologies at Each Site

**CH2MHILL**

Estimator: Wm. Griffith / MKE  
 Project Mgr: Webster, Todd/MKE  
 Project #: 316657  
 Estimate #: Conceptual / Alternatives  
 Rev. #: # 4  
 Est. Date: 11/29/2004

## Order-of-Magnitude Estimate

/ \$849,000 High Value +50 %

\ \$396,200 Low Value - 30%

Combined Engineer's Estimate \$566,000.00

Facility			Alternate Vendor CDS	Equipment Footprint	Alternate Vendor KRUGER <sup>1</sup>	Alternate Vendor GRANDE	Alternate Vendor Fresh Creek Tech	Alternate Vendor Parkson Corp	Comments	Preferred Structural Alternative
Site # 17	Alt #1	Waldron	\$81,000	3.5' x 4.33'	\$1,797,223	\$125,000	\$176,049	\$217,922	select smallest unit	\$81,000
Site # 17	Alt #2	Circle/	\$273,000	10' x 15'						
Site # 17	Alt #3	Wildwood	\$776,000	22' x 45'	43.2' x 15.1'	8.5' x 10'	4' x 16'	12.6'		
Site # 21	Alt #1	Fairfax Avenue/	\$85,000	4.25' x 4.33'	\$1,878,122	\$131,000	\$224,497	\$231,060	select highest quality screening alternative	\$273,000
Site # 21	Alt #2	Foster	\$273,000	10' x 15'						
Site # 21	Alt #3	Park	\$813,000	30' x 50'	44.9' x 16.1'	8' x 8'	7.5' x 17'	12.6'		
Site # 26	Alt #1	Third Street	\$131,000	3.5' x 17.33'	\$4,230,509	\$197,624	\$395,775	\$337,366	select smallest unit	\$131,000
Site # 26	Alt #2	Pump Station	\$739,000	30' x 18'						
Site # 26	Alt #3		\$1,743,000	61' x 70'	52.8' x 20.9'	20' x 10'	13.33' x 19.33	25.7'		
Site # 52	Alt #1	Concordia High	\$77,000	2' x 4.33'	\$1,423,040	\$118,918	\$182,175	\$180,442	select smallest unit	\$77,000
Site # 52	Alt #2	School	\$235,000	10' x 12'						
Site # 52	Alt #3	Access	\$560,324	21' x 35'	31.9' x 10.7'	6' x 8'	4' x 16'	12.6'		

## Operations &amp; Maintenance Costs

	CDS - Raked Bar	CDS - GSS	CDS - FSS		Alternate Vendor KRUGER1	Alternate Vendor GRANDE	Alternate Vendor Fresh Creek Tech One trip replacement / 3 maint	Alternate Vendor Parkson Corp 4 annual Trips, elec, inspect, replace fluids		
Frequency	Annual Based on trips	Annual Based on trips	Annual Based on trips	Est 3 days	Based per Day Quote					
Site # 17	\$372	\$2,630	\$4,419	\$5,083	annual	\$2,086	\$4,961	\$335	\$372	
Site # 21	\$372	\$2,630	\$4,419	\$5,899	annual	\$2,086	\$4,961	\$335	\$2,630	
Site # 26	\$372	\$2,630	\$4,419	\$20,140	annual	\$2,086	\$4,961	\$335	\$372	
Site # 52	\$372	\$2,630	\$4,419	\$2,127	annual	\$2,086	\$4,961	\$335	\$372	
Subtotal - Operations & Maintenance Costs										\$3,746

**Total CCC & O-M** **\$566,000**  
 Rounded (3)

<sup>1</sup> Kruger's ACTIFLO process will likely require additional pre-screening best determined by site-specific analysis; therefore, it is likely that the construction price will increase to include some amount of pre-screening should this alternative move forward in selection.

**Order-of-Magnitude Estimate**

An order-of-magnitude estimate is made without detailed engineering data. Some examples include:

- > An estimate from cost capacity curves
- > An estimate using scale-up or scale-down factors
- > An approximate ratio estimate, base on technologies

Typically, an order-of-magnitude estimate is prepared at the end of the schematic design phase of the design delivery process. It is normally expected that an estimate of this type would be accurate within **plus 50 percent to minus 30 percent of the estimated cost**. The cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project costs, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.



## PARKSON ROMAG Screen System

## MARK-UPS:

OVERHEAD =  
 PROFIT =  
 MOB/END/INS. =  
 CONTINGENCY =

MATL	LABOR	EQUIP.	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MKE  
 Project Mgr: Webster, Todd/MKE  
 Project #: 316657  
 Estimate #: Conceptual / Alternatives  
 Rev #: # 3  
 Estimate Date: 10/02/2004

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS UNIT \$	LABOR MH	Man- Hrs	RATE	AMOUNT	EQUIPMENT UNIT \$	AMOUNT	TOTAL	RESC
Park Site 17 Option 1 ROMAG RSW 4X3			Cost		Marked-up								
			\$150,291		\$217,922								
1.		Equipment	1.0	ea	\$103,950	171	171.0	\$31.04	\$5,307	\$10,395	\$10,395	\$119,652	Vendor Quote Lbr/Equip
2.		17 x 12 x 10d Excavate @ Equipment Structure	76	cy		0.29	22.0	\$31.04	\$682	\$5,85	\$442	\$1,124	RSM Bldg-04 P-49
3.		Structure Base Stone	15	cy	\$4.49	0.25	3.8	\$31.04	\$117	\$1.71	\$28	\$210	RSM Bldg-04 P-52
4.		Backfill / Vibrating Plate	60	cy		0.13	8.0	\$31.04	\$250	\$0.23	\$14	\$263	RSM Bldg-04 P-53
5.		12" x 8"	96	sf	\$2.89	0.03	2.5	\$31.04	\$77	\$0.01	\$1	\$358	RSM HC-2004 P-151
6.		12" Slab on Grade	15	cy	\$126.00	5.00	74.1	\$31.04	\$2,299	\$18.65	\$278	\$4,442	RSM HC-2004 P-151
7.		12" Walls, 10' FOOT HIGH	3.6	cy	\$159.00	5.41	19.2	\$31.04	\$597	\$19.35	\$68	\$1,231	RSM HC-2004 P-150
8.		12" Concrete Roof	1	ls	\$7,500.00	80.6	80.6	\$31.04	\$2,503	\$150	\$150	\$10,153	Est Judgement
9.		Weir Allowance	2	cy	\$233.00	12.8	30.4	\$31.04	\$942	\$48	\$114	\$1,883	RSM HC-2004 P-150
10.		16 If 12" Sq Beams	17.5%		\$12,713			\$7,467	\$1,867	\$1,032		\$21,271	Adjustment for Concrete &
11.		ENR Index Price Adjustment										\$5,045	Est Judgement
12.		Structure Subtotal	25%	ls	\$3,178			\$31.04				\$4,323	
13.		Elec & I&C % of Structure	3%	%				\$31.04					
14.		Misc. Materials & Consumable						\$15,023					
ST		ROMAG RSW 4X3			\$123,436	423.9		\$15,023		\$11,831			

Park Site 21 Option 1 ROMAG RSW 5X3			Cost		Marked-up								
			\$158,352		\$231,060								
1.		Equipment	1.0	ea	\$112,200	185	184.5	\$31.04	\$5,728	\$11,220	\$11,220	\$129,148	Vendor Quote Lbr/Equip
2.		17 x 12 x 10d Excavate @ Equipment Structure	76	cy		0.29	22.0	\$31.04	\$682	\$5,85	\$442	\$1,124	RSM Bldg-04 P-49
3.		Structure Base Stone	15	cy	\$4.49	0.25	3.8	\$31.04	\$117	\$1.71	\$28	\$210	RSM Bldg-04 P-52
4.		Backfill / Vibrating Plate	60	cy		0.13	8.0	\$31.04	\$250	\$0.23	\$14	\$263	RSM Bldg-04 P-53
5.		12" x 8"	96	sf	\$2.89	0.03	2.5	\$31.04	\$77	\$0.01	\$1	\$358	RSM HC-2004 P-151
6.		12" Slab on Grade	15	cy	\$126.00	5.00	74.1	\$31.04	\$2,299	\$18.65	\$278	\$4,442	RSM HC-2004 P-151
7.		12" Walls, 10' FOOT HIGH	3.6	cy	\$159.00	5.41	19.2	\$31.04	\$597	\$19.35	\$68	\$1,231	RSM HC-2004 P-150
8.		12" Concrete Roof	1	ls	\$7,500.00	80.6	80.6	\$31.04	\$2,503	\$150	\$150	\$10,153	Est Judgement
9.		Weir Allowance	2	cy	\$233.00	12.8	30.4	\$31.04	\$942	\$48	\$114	\$1,883	RSM HC-2004 P-150
10.		16 If 12" Sq Beams	17.5%		\$10,830			\$6,525	\$1,631	\$978		\$18,338	Adjustment for Concrete &
11.		ENR Index Price Adjustment										\$4,338	Est Judgement
12.		Structure Subtotal	25%	ls	\$2,707			\$31.04				\$4,594	
13.		Elec & I&C % of Structure	3%	%				\$31.04					
ST		ROMAG RSW 5X3			\$131,449	437.9		\$15,222		\$12,681			

# PARKSON ROMAG Screen System

MARK-UPS:

OVERHEAD =  
PROFIT =  
MOBILIZATION =  
CONTINGENCY =

MAT'L	LABOR	EQUIP.	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MKE  
Project Mgr: Webster, Todd/MKE  
Project #: 316657  
Estimate #: Conceptual / Alternatives  
Rev #: # 3  
Estimate Date: 10/02/2004

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS UNIT \$	LABOR Unit MH	Man-Hrs	RATE	AMOUNT	EQUIPMENT UNIT \$	AMOUNT	TOTAL	RESC
Park Site 25 Option 1 ROMAG RSW 5X7			Cost \$232,666		Marked-up \$337,366								
1.		Equipment	1.0	ea	\$154,550	254	254.2	\$31.04	\$7,890	\$15,455	\$15,455	\$177,895	Vendor Quote Lbr/Equip
2.		30 x 12 x 10d Excavate @ Equipment Structure	133	cy		0.29	38.8	\$31.04	\$1,204	\$5.85	\$780	\$1,984	RSM Bldg-04 P-49
3.		Structure Base Stone	27	cy	\$4.49	0.25	6.6	\$31.04	\$206	\$1.71	\$46	\$374	RSM Bldg-04 P-52
4.		Backfill / Vibrating Plate	107	cy		0.13	14.2	\$31.04	\$440	\$0.23	\$25	\$465	RSM Bldg-04 P-53
5.		26' x 8' 12" Slab on Grade	96	sf	\$2.89	0.03	2.5	\$31.04	\$77	\$0.01	\$1	\$358	RSM HC-2004 P-151
6.		12" Walls, 10' FOOT HIGH	25	cy	\$126.00	5.00	125.9	\$31.04	\$3,908	\$18.65	\$470	\$7,551	RSM HC-2004 P-151
7.		12" Concrete Roof	7.7	cy	\$159.00	5.41	41.7	\$31.04	\$1,294	\$19.35	\$149	\$2,668	RSM HC-2004 P-150
8.		Weir Allowance	2	ea	\$7,500.00	80.6	161.3	\$31.04	\$5,006	\$150	\$300	\$20,308	Est Judgement
9.		12" Sq Beams	2	cy	\$233.00	12.8	30.4	\$31.04	\$942	\$48	\$114	\$1,608	RSM HC-2004 P-150
10.		ENR Index Price Adjustment	17.5%		\$23,888			\$13,078		\$1,664		\$3,540	Adjustment for Concrete & Est Judgement
11.		Structure Subtotal	25%	ls	\$5,972			\$31.04	\$3,269			\$9,241	
12.		Elec & I&C % of Structure	3%	%				\$31.04	\$928			\$6,591	
13.		Misc. Materials & Consumable			\$189,542		695.8	\$24,866		\$17,859			
ST		ROMAG RSW 5X7											

Park Site 52 Option 1 ROMAG RSW 2x3			Cost \$124,443		Marked-up \$180,442								
1.		Equipment	1.0	ea	\$84,700	139	139.3	\$31.04	\$4,324	\$8,470	\$8,470	\$97,494	Vendor Quote Lbr/Equip
2.		17 x 12 x 10d Excavate @ Equipment Structure	76	cy		0.29	22.0	\$31.04	\$682	\$5.85	\$442	\$1,126	RSM Bldg-04 P-49
3.		Structure Base Stone	15	cy	\$4.49	0.25	3.8	\$31.04	\$117	\$1.71	\$28	\$210	RSM Bldg-04 P-52
4.		Backfill / Vibrating Plate	60	cy		0.13	8.0	\$31.04	\$250	\$0.23	\$14	\$263	RSM Bldg-04 P-53
5.		12' x 8' 12" Slab on Grade	96	sf	\$2.89	0.03	2.5	\$31.04	\$77	\$0.01	\$1	\$358	RSM HC-2004 P-151
6.		12" Walls, 10' FOOT HIGH	15	cy	\$126.00	5.00	74.1	\$31.04	\$2,299	\$18.65	\$278	\$4,442	RSM HC-2004 P-151
7.		12" Concrete Roof	3.6	cy	\$159.00	5.41	19.2	\$31.04	\$597	\$19.35	\$69	\$1,231	RSM HC-2004 P-150
8.		Weir Allowance	1	ls	\$5,500.00	80.6	80.6	\$31.04	\$2,503	\$150	\$150	\$8,153	Est Judgement
9.		12" Sq Beams	2	cy	\$233.00	12.8	30.4	\$31.04	\$942	\$48	\$114	\$1,608	RSM HC-2004 P-150
10.		ENR Index Price Adjustment	17.5%		\$10,363			\$7,467		\$1,092		\$1,533	Adjustment for Concrete & Est Judgement
11.		Structure Subtotal	25%	ls	\$2,591			\$31.04	\$1,867			\$4,457	
12.		Elec & I&C % of Structure	3%	%				\$31.04	\$554			\$3,570	
13.		Misc. Materials & Consumable			\$100,593		391.3	\$14,011		\$9,848			
ST		ROMAG RSW 2x3											

# Fresh Creek System

## MARK-UPS:

OVERHEAD =  
 PROFIT =  
 MOBILIZATION =  
 CONTINGENCY =

MATL	LABOR	EQUIP.	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MKE  
 Project Mgr: Webster, Todd/MKE  
 Estimate #: 316657  
 Estimate #: Conceptual / Alternatives  
 Rev. #: # 2  
 Estimate Date: 09/30/2004

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR		Equipment		RE
					UNIT \$	AMOUNT	Unit	Man-Hrs	RATE	AMOUNT	TOTAL
Fresh Creek Site 17											
Floatable Collection Systems											
Cost					Marked-up						
					\$176,049						
1.	10' x 20' x 12d	30" x 30" x 8' x 1/2" Mesh, 19 cfs (qty 1)	1.0	ea	\$97,500	\$97,500	273	272.6	\$31.04	\$8,461	\$9,750
2.		Excavate @ Equipment Structure	89	cy			0.29	25.9	\$31.04	\$903	\$5,850
3.		Structure Base Stone	15	cy	\$4.49	\$67		0.25	\$31.04	\$114	\$254
4.		Backfill / Vibrating Plate	74	cy			0.13	9.9	\$31.04	\$306	\$171
5.	4' x 16'	12" Slab on Grade		sf	\$2.89		0.03		\$31.04	\$0.01	
6.		12" Walls, 10' FOOT HIGH		cy	\$126.00		5.00		\$31.04	\$1865	
7.	4' x 16'	12" Concrete Roof		cy	\$159.00		5.41		\$31.04	\$1935	
8.	8 ft	12" Sq Beams / Columns		cy	\$233.00		12.8		\$31.04	\$48	
9.	#DIV/0!	ENR Index Price Adjustment	17.5%								
10.		Structure Subtotal			\$67				\$1,223		
11.		Elec & I&C % of Structure	25%	ls		\$17			\$31.04	\$306	
12.		Misc. Materials & Consumable	3%	%		\$2,927		9.4	\$31.04	\$291	
ST		Floatable Collection Systems			\$100,511		321.4		\$10,281	\$10,522	\$3,527
Vendor Quote											
		RSM Bldg-04								\$5,85	
		RSM Bldg-04								\$1,71	
		RSM Bldg-04								\$0.23	
		RSM HC-2004								\$0.01	
		RSM HC-2004								\$18.65	
		RSM HC-2004								\$19.35	
		RSM HC-2004								\$48	
		Adjustment for Concrete									
		\$1,852								\$562	
		Est Judgement									\$322

Fresh Creek Site 21														
Floatable Collection Systems														
Cost														
\$154,826														
Marked-up														
\$224,497														
30" x 30" x 8' x 1/2" Mesh, 22 cfs (qty 1)														
1.	12' x 22' x 12d	Excavate @ Equipment Structure	117	cy	\$124,250	\$24,250	347	347.4	\$31.04	\$10,769	\$12,425	\$12,425	\$147,458	Vendor Quote
2.		Structure Base Stone	20	cy	\$4.49	\$88	0.29	34.1	\$31.04	\$1,060	\$5.65	\$666	\$1,746	RSM Bldg-04 P-49
3.		Backfill / Vibrating Plate	98	cy			0.25	4.9	\$31.04	\$151	\$1.71	\$33	\$272	RSM Bldg-04 P-52
4.	7.5' x 17'	12" Slab on Grade		sf	\$2.89		0.13	13.0	\$31.04	\$404	\$0.23	\$22	\$426	RSM Bldg-04 P-53
5.		12" Walls, 10' FOOT HIGH		cy	\$126.00		0.03		\$31.04		\$0.01			RSM HC-2004 P-15
6.	7.5' x 17'	12" Concrete Roof		cy	\$159.00		5.00		\$31.04		\$18.65			RSM HC-2004 P-15
7.	15 ft	12" Sq Beams / Columns		cy	\$233.00		5.41		\$31.04		\$19.35			RSM HC-2004 P-15
8.	#DIV/0!	ENR Index Price Adjustment	17.5%				12.8		\$31.04		\$48			RSM HC-2004 P-15
9.		Structure Subtotal			\$38				\$1,615		\$742			Adjustment for Concrete
10.		Elec & I&C % of Structure	25%	ls		\$22			\$31.04	\$404			\$2,445	Est Judgement
11.		Misc. Materials & Consumable	3%	%		\$1,731	12.0		\$31.04	\$372			\$426	
12.		Floatable Collection Systems			\$128,091		411.4		\$31.04		\$13,562		\$4,498	
ST									\$13,173					

Fresh Creek System

MARK-UPS:

OVERHEAD =  
PROFIT =  
MOBILIZATION =  
CONTINGENCY =

MATL	LABOR	EQUIP.	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MKE  
Project Mgr: Webster, Todd/MKE  
Project #: 316657  
Estimate #: Conceptual / Alternatives  
Rev #: # 2  
Estimate Date : 09/30/2004

Item	CSI Div	DESCRIPTION	QTY		MATERIALS		LABOR		Equipment		TOTAL	RE	
			UNIT		UNIT \$	AMOUNT	Unit	Man-Hrs	AMOUNT	UNIT \$			AMOUNT
Fresh Creek Site			Cost		Marked-up								
26		Floatable Collection Systems	\$272,948		\$395,775								
1.	18" x 24" x 12'd	30" x 30" x 8' x 12" Mesh, 72 cfs (qty 3)	1.0 ea		\$219,350	613	613.3		\$31.04	\$19,036	\$21,935	\$260,321	Vendor Quote
2.		Excavate @ Equipment Structure	192 cy			0.29	55.9		\$31.04	\$1,734	\$5.85	\$1,128	RSM Bldg-04 P-49
3.		Structure Base Stone	32 cy		\$4.49	0.25	8.0		\$31.04	\$247	\$1.71	\$55	RSM Bldg-04 P-52
4.		Backfill / Vibrating Plate	160 cy			0.13	21.3		\$31.04	\$650	\$0.23	\$37	RSM Bldg-04 P-53
5.	13.33' x 19.33'	12" Slab on Grade	sf		\$2.89	0.03			\$31.04		\$0.01		RSM HC-2004 P-15
6.		12" Walls, 10' FOOT HIGH	cy		\$126.00	5.00			\$31.04		\$18.65		RSM HC-2004 P-15
7.	13.33' x 19.33'	12" Concrete Roof	cy		\$153.00	5.41			\$31.04		\$18.35		RSM HC-2004 P-15
8.	26.75 lf	12" Sq Beams / Columns	cy		\$233.00	12.8			\$31.04		\$48		RSM HC-2004 P-15
9.	#DIV/0!	ENR Index Price Adjustment	17.5%										Adjustment for Concrete
10.		Structure Subtotal			\$144				\$2,642		\$1,215		\$4,000
11.		Elec & I&C % of Structure	25%	ls					\$31.04				Est. Judgement
12.		Misc. Materials & Consumable	3%	%					\$31.04				
ST		Floatable Collection Systems			\$226,115	719.4			\$22,989		\$23,844	\$7,931	

Fresh Creek Site			Cost	Marked-up									
52		Floatable Collection Systems	\$125,638	\$182,175									
1.	18" x 25" x 12'd	30" x 30" x 8' x 12" Mesh, 8 cfs (qty 1)	1.0 ea	\$98,675	276	275.9			\$31.04	\$8,553	\$9,868	\$117,108	Vendor Quote
2.		Excavate @ Equipment Structure	200 cy		0.29	58.2			\$31.04	\$1,805	\$585	\$2,576	RSM Bldg-04 P-49
3.		Structure Base Stone	53 cy	\$4.49	0.25	8.3			\$31.04	\$258	\$57	\$464	RSM Bldg-04 P-52
4.		Backfill / Vibrating Plate	167 cy		0.13	22.2			\$31.04	\$688	\$38	\$726	RSM Bldg-04 P-53
5.	4' x 16'	12" Slab on Grade	sf	\$2.89	0.03				\$31.04		\$0.01		RSM HC-2004 P-15
6.		12" Walls, 10' FOOT HIGH	cy	\$126.00	5.00				\$31.04		\$18.65		RSM HC-2004 P-15
7.	4' x 16'	12" Concrete Roof	cy	\$153.00	5.41				\$31.04		\$19.35		RSM HC-2004 P-15
8.	8 lf	12" Sq Beams / Columns	cy	\$233.00	12.8				\$31.04		\$48		RSM HC-2004 P-15
9.	#DIV/0!	ENR Index Price Adjustment	17.5%										Adjustment for Concrete
10.		Structure Subtotal		\$150					\$2,752		\$1,285	\$4,167	Est. Judgement
11.		Elec & I&C % of Structure	25%						\$31.04				
12.		Misc. Materials & Consumable	3%						\$31.04				
ST		Floatable Collection Systems		\$101,628	375.5				\$12,343		\$11,467	\$3,639	

## GRANDE ACU SCREEN SYSTEM

## MARK-UPS:

OVERHEAD =  
PROFIT =  
MOB/OND/INS. =  
CONTINGENCY =

MATL	LABOR	EQUIP.	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MKE  
Project Mgr: Webster, Todd/MKE  
Project #: 316657  
Estimate #: Conceptual / Alternatives  
Rev. #: 09/28/2004  
Estimate Date :

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR		EQUIPMENT		TOTAL	RESOU
			Cost		UNIT \$	AMOUNT	Unit	Man-Hrs	UNIT \$	AMOUNT		
GRANDE Site 17			Marked-up		\$124,795							
Acu-Screen, ACU-Bend			Marked-up		\$124,795							
1.		Acu Screen / ACU Bend	1.0	ea		\$60,400	169	168.9		\$5,242	\$71,682	Lib/Equip -
2.		15' sq x 12' Excavate @ Equipment Structure	100	cy		\$60,400	0.23	28.1		\$31.04	\$5,040	Vendor Quote
3.		Structure Base Stone	6	cy		\$4.49	0.25	1.6		\$31.04	\$5.85	RSM Bldg-04 P-49 02
4.		Backfill / Vibrating Plate	94	cy		\$2.88	0.13	12.5		\$31.04	\$1.71	RSM Bldg-04 P-52 02
5.		8.5' x 10' 12" Slab on Grade	85	sf		\$2.46	0.03	2.2		\$31.04	\$0.23	RSM Bldg-04 P-53 02
6.		12" Walls, 10' FOOT HIGH	14	cy		\$126.00	5.00	68.5		\$31.04	\$408	RSM HC-2004 P-151 02
7.		8.5' x 10' 12" Concrete Roof	3.1	cy		\$159.00	5.41	17.0		\$31.04	\$4,108	RSM HC-2004 P-151 02
8.		17' ll 12" Sq Beams / Columns	3	cy		\$233.00	5.67	12.8		\$31.04	\$1,099	RSM HC-2004 P-150 02
9.		\$433 ENR Index Price Adjustment	17.5%			\$535		32.2		\$31.04	\$1,709	RSM HC-2004 P-150 02
10.		Structure Subtotal				\$3,623				\$5,363	\$535	Adjustment for Concrete & F
11.		Elec & I&C % of Structure	25%	ls		\$906				\$31.04	\$2,172	Est Judgement
12.		Misc. Materials & Consumable	3%	%		\$1,948		10.0		\$31.04	\$2,198	Est Judgement
ST		Acu-Screen, ACU-Bend				\$56,877	342.0			\$11,880	\$7,308	

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR		EQUIPMENT		TOTAL	RESOU
			Cost		UNIT \$	AMOUNT	Unit	Man-Hrs	UNIT \$	AMOUNT		
GRANDE Site 21			Marked-up		\$131,229							
Acu-Screen			Marked-up		\$131,229							
1.		Acu Screen (GAS-HWS-168)	1.0	ea		\$46,400	130	128.7		\$4,027	\$55,067	Lib/Equip -
2.		15' sq x 12' Excavate @ Equipment Structure	100	cy		\$46,400	0.23	28.1		\$31.04	\$4,640	Vendor Quote
3.		Structure Base Stone	5	cy		\$4.49	0.25	1.2		\$31.04	\$5.85	RSM Bldg-04 P-49 02
4.		Backfill / Vibrating Plate	95	cy		\$2.88	0.13	12.7		\$31.04	\$1.71	RSM Bldg-04 P-52 02
5.		8' x 8' 12" Slab on Grade	64	sf		\$2.46	0.03	1.7		\$31.04	\$0.23	RSM Bldg-04 P-53 02
6.		12" Walls, 10' FOOT HIGH	18	cy		\$126.00	6.00	88.9		\$31.04	\$2,377	RSM HC-2004 P-151 02
7.		45' x 17' 12" Concrete Roof	2.4	cy		\$159.00	5.41	12.8		\$31.04	\$5,330	RSM HC-2004 P-151 02
8.		Weir Allowance	1	ls		\$11,347	80.6	80.6		\$31.04	\$2,573	RSM HC-2004 P-150 02
9.		16' ll 12" Sq Beams / Columns	2	cy		\$233.00	5.67	30.4		\$31.04	\$1,608	RSM HC-2004 P-150 02
10.		\$1,066 ENR Index Price Adjustment	17.5%			\$2,573				\$31.04	\$2,573	Adjustment for Concrete & F
11.		Structure Subtotal				\$17,295				\$7,986	\$26,538	Est Judgement
12.		Elec & I&C % of Structure	25%	ls		\$4,324				\$31.04	\$6,320	Est Judgement
13.		Misc. Materials & Consumable	3%	%		\$2,041		11.6		\$31.04	\$2,578	Est Judgement
ST		Acu-Screen				\$70,059	398.7			\$14,370	\$8,074	

# GRANDE ACU SCREEN SYSTEM

## MARK-UPS:

OVERHEAD =  
 PROFIT =  
 MOB/BD/INS. =  
 CONTINGENCY =

MATL	LABOR	EQUIP.	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

Estimator: Wm. Griffin / MKE  
 Project Mgr: Webster, Todd/MKE  
 Project #: 316657  
 Estimate #: Conceptual / Alternatives  
 Rev. #: 09/28/2004  
 Estimate Date :

Item	CSI Div	DESCRIPTION	QTY		UNIT	MATERIALS		LABOR		Equipment		TOTAL	RESOU
						UNIT \$	AMOUNT	Unit	Man-Hrs	UNIT \$	AMOUNT		
GRANDE Site 26			Cost			Marked-up							
			\$136,293			\$197,624							
Acu-Screen, ACU-Bend													
1.	25' X 15' x 12d	Acu Screen (GAS-HWD-500)	1.0	ea		\$65,000	\$65,000	181.7	\$31.04	\$5,641	\$6,500	\$77,141	Unit Equip - 4
2.	Excavate @ Equipment Structure		167	cy				0.29	\$31.04	\$1,505	\$5.85	\$375	RSM Blg-04 P-49 02
3.	Structure Base Stone		6	cy		\$4.49	\$26	0.25	\$31.04	\$49	\$1.71	\$11	RSM Blg-04 P-52 02
4.	Backfill / Vibrating Plate		160	cy				0.13	\$31.04	\$562	\$0.23	\$37	RSM Blg-04 P-53 02
5.	20' x 10'	12" Slab on Grade	144	sf		\$2.89	\$418	0.03	\$31.04	\$118	\$0.01	\$1	RSM HC-2004 P-151 01
6.	12" Walls, 10' FOOT HIGH		23	cy		\$126.00	\$2,898	5.00	\$31.04	\$3,559	\$18.65	\$428	RSM HC-2004 P-151 01
7.	20' x 10'	12" Concrete Roof	7.4	cy		\$159.00	\$1,178	5.41	\$31.04	\$1,244	\$19.35	\$459	RSM HC-2004 P-150 01
8.	Weir Allowance		1	ls		\$20,000	\$20,000	145.2	\$31.04	\$4,505	\$495	\$25,000	Grande Quote
8.	20 If 12" Sq Beams		3	cy		\$233.00	\$699	12.8	\$31.04	\$1,178	\$48	\$142	RSM HC-2004 P-150 01
9.	ENR Index Price Adjustment		17.5%				\$4,406						Adjustment for Concrete & F
10.	Structure Subtotal					\$29,612			\$12,822		\$2,233		\$44,567
11.	Elec & I&C % of Structure		25%	ls			\$7,403		\$31.04	\$3,205		\$10,608	Est. Judgement
12.	Misc. Materials & Consumable		3%	%			\$3,060		\$31.04	\$554		\$3,878	
ST		Acu-Screen, ACU-Bend				\$105,075		612.7	\$22,222		\$9,995		

GRANDE Site 52		Acu-Screen, ACU-Bend		Cost \$82,012	Marked-up \$118,918																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
1.	Acu Screen (GAS-HWS-107)	1.0	ea		\$44,500																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									</

MARK-UPS:

OVERHEAD =  
PROFIT =  
MOB/BONDS =  
CONTINGENCY =

MATL	LABOR	EQUIP.	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MKE  
Project Mgr: Webster, Todd/MKE  
Project #: 316857  
Estimate #: Conceptual / Alternatives  
Rev. #: # 2  
Estimate Date: 09/30/2004

MARK-UPS:

OVERHEAD =

PROFIT =

MOB/ONDONS =

CONTINGENCY =

KRUGER ACTIFLO System

Estimator: Wm. Griffith / MKE  
Project Mgr: Webster, Todd/MKE  
Project #: 316657  
Estimate #: Conceptual / Alternatives # 2  
Rev. #: 09/30/2004  
Estimate Date :

Item	CSI Div	DESCRIPTION	QTY		UNIT \$		LABOR		UNIT \$	AMOUNT	EQUIPMENT		TOTAL	RESC
ACT Site 21			Option 1		Marked-up									
			\$1,295,257		\$1,878,122									
1 X 14 mgd Design														
1.		Equipment	1.0	ea		\$1,050,000	1,727.0	1,727.0	\$31.04	\$53,602	\$105,000	\$105,000	\$1,208,602	Lbr/Equip
2.		20 x 50 x 10'd Excavate @ Equipment Structure	370	cy			0.29	107.8	\$31.04	\$3,345	\$5.85	\$2,167	\$5,512	P-49
3.		Structure Base Stone	74	cy		\$4.49	\$333	0.25	\$31.04	\$572	\$1.71	\$127	\$1,032	P-52
4.		Backfill / Vibrating Plate	296	cy			0.13	39.4	\$31.04	\$1,223	\$0.23	\$68	\$1,291	P-53
5.	45' x 17'	12" Slab on Grade	765	sf		\$2.89	\$2,211	0.03	\$31.04	\$617	\$0.01	\$8	\$2,898	P-151
6.		12" Walls, 10' FOOT HIGH	46	cy		\$126.00	\$5,787	5.00	\$31.04	\$7,126	\$18.65	\$857	\$13,768	P-151
7.	45' x 17'	12" Concrete Roof	28.3	cy		\$159.00	\$4,505	5.41	\$31.04	\$4,758	\$19.35	\$548	\$9,811	P-150
8.	34 lf	12" Sq Beams	5	cy		\$233.00	\$1,174	12.8	\$31.04	\$2,002	\$48	\$242	\$3,417	P-150
9.		ENR Index Price Adjustment	17.5%				\$2,393						\$2,393	Adjustment for Concrete &
10.		Structure Subtotal				\$16,402			\$19,643		\$4,016		\$40,061	
11.		Elec & I&C % of Structure	25%	ls		\$4,101			\$31.04	\$4,911			\$9,011	Est Judgement
12.														
13.		Misc. Materials & Consumable	3%	%		\$32,115		70.8	\$31.04	\$2,197		\$3,270	\$37,583	
ST		1 X 14 mgd Design				\$1,102,618		2,439.7	\$80,353		\$112,286			
ACT Site 52			Option 2		Marked-up									
			\$981,407		\$1,423,040									
1 X 5 mgd Design														
1.		Equipment	1.0	ea		\$900,000	1,316	1,316.8	\$31.04	\$40,839	\$90,000	\$90,000	\$920,839	Lbr/Equip
2.		40'x20 x 12'd Excavate @ Equipment Structure	296	cy			0.29	86.2	\$31.04	\$2,676	\$5.85	\$1,733	\$4,409	P-49
3.		Structure Base Stone	59	cy		\$4.49	\$266	0.25	\$31.04	\$458	\$1.71	\$101	\$825	P-52
4.		Backfill / Vibrating Plate	237	cy			0.13	31.5	\$31.04	\$978	\$0.23	\$59	\$1,033	P-53
5.	32' X 12'	12" Slab on Grade	384	sf		\$2.89	\$1,110	0.03	\$31.04	\$310	\$0.01	\$4	\$1,423	P-151
6.		12" Walls, 10' HIGH	33	cy		\$126.00	\$4,107	5.00	\$31.04	\$5,057	\$18.65	\$608	\$9,772	P-151
7.	45' x 17'	12" Concrete Roof	14.2	cy		\$159.00	\$2,261	5.41	\$31.04	\$2,388	\$19.35	\$275	\$4,923	P-150
8.	24 lf	12" Sq Beams	4	cy		\$233.00	\$828	12.8	\$31.04	\$1,413	\$48	\$171	\$2,412	P-150
9.		ENR Index Price Adjustment	17.5%				\$1,454						\$1,454	Adjustment for Concrete &
10.		Structure Subtotal				\$10,028			\$13,281		\$2,547		\$25,253	
11.		Elec & I&C % of Structure	25%	ls		\$2,506			\$31.04	\$3,320			\$5,827	Est Judgement
12.														
13.		Misc. Materials & Consumable	3%	%		\$24,376		52.3	\$31.04	\$1,624		\$2,488	\$28,488	
ST		1 X 5 mgd Design				\$836,908		1,795.0	\$59,064		\$85,435			

# MARK-UPS:

Estimator: Wm. Griffith / MKE  
 Project Mgr: Webster, Todd/MKE  
 Estimate #: 316657  
 Estimate #: Conceptual / Alternatives  
 Rev. #: # 2  
 Estimate Date: 09/30/2004

MATL	LABOR	EQUIP.	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

OVERHEAD =  
 PROFIT =  
 MOB/OND/INS. =  
 CONTINGENCY =

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS UNIT \$	LABOR Unit MH	Man-Hrs	RATE	AMOUNT	EQUIPMENT UNIT \$	AMOUNT	TOTAL	RESC
ACT Site 17			1 x 12 mgd Design										
1.	Option 3	Equipment	1.0	ea	\$1,000,000	1,645	1,644.7	\$31.04	\$51,048	\$100,000	\$100,000	\$1,151,048	Vendor Quote Ltr/Equip
2.	60 x 25' x 12' d	Excavate @ Equipment Structure	444	cy		0.29	129.3	\$31.04	\$4,014	\$5.85	\$2,600	\$6,614	RSM Bldg-04 P-49
3.		Structure Base Stone	51	cy	\$4.49	0.25	12.7	\$31.04	\$395	\$1.71	\$87	\$714	RSM Bldg-04 P-52
4.	43' x 22'	Backfill / Vibrating Plate	393	cy		0.13	52.3	\$31.04	\$1,624	\$0.23	\$90	\$1,714	RSM Bldg-04 P-53
5.		12" Slab on Grade	695	sf	\$2.89	0.03	18.1	\$31.04	\$551	\$0.01	\$7	\$2,576	RSM HC-2004 P-151
6.	53' x 22'	12" Walls, 10' HIGH	56	cy	\$126.00	5.00	277.7	\$31.04	\$8,620	\$18.65	\$1,036	\$16,656	RSM HC-2004 P-151
7.		12" Concrete Roof	25.7	cy	\$159.00	5.41	199.2	\$31.04	\$4,321	\$19.35	\$498	\$9,912	RSM HC-2004 P-150
8.	32 If	12" Sq Beams	5	cy	\$233.00	12.8	60.7	\$31.04	\$1,884	\$48	\$228	\$3,216	RSM HC-2004 P-150
9.		ENR Index Price Adjustment	17.5%		\$2,486							\$2,486	Adjustment for Concrete &
10.		Structure Subtotal			\$16,923			\$21,419	\$5,355	\$4,546		\$42,885	Est Judgement
11.		Elec & I&C % of Structure	25%	ls	\$4,230			\$31.04				\$9,585	
12.		Misc. Materials & Consumable	3%	%	\$30,635		70.0	\$31.04	\$2,174		\$3,136	\$35,945	
ST		1 x 12 mgd Design			\$1,081,785	2,404.9		\$79,997		\$107,683			

ACT Site 26			2 x 24 mgd Design										
1.	Option 4	Equipment	1.0	ea	\$2,400,000	3,947	3,947.4	\$31.04	\$122,516	\$240,000	\$240,000	\$2,762,516	Vendor Quote Ltr/Equip
2.	60 x 25' x 12' d	Excavate @ Equipment Structure	667	cy		0.29	194.0	\$31.04	\$6,021	\$5.85	\$3,900	\$9,921	RSM Bldg-04 P-49
3.		Structure Base Stone	111	cy	\$4.49	0.25	27.7	\$31.04	\$859	\$1.71	\$190	\$1,548	RSM Bldg-04 P-52
4.	53' x 22'	Backfill / Vibrating Plate	556	cy		0.13	73.9	\$31.04	\$2,293	\$0.23	\$128	\$2,421	RSM Bldg-04 P-53
5.		12" Slab on Grade	1,166	sf	\$2.89	0.03	30.3	\$31.04	\$941	\$0.01	\$12	\$4,322	RSM HC-2004 P-151
6.	53' x 22'	12" Walls, 10' FOOT HIGH	56	cy	\$126.00	5.00	277.7	\$31.04	\$8,620	\$18.65	\$1,036	\$16,656	RSM HC-2004 P-151
7.		12" Concrete Roof	43.2	cy	\$159.00	5.41	233.6	\$31.04	\$7,251	\$19.35	\$836	\$14,954	RSM HC-2004 P-150
8.	44 If	12" Sq Beams	7	cy	\$233.00	12.8	83.5	\$31.04	\$2,591	\$48	\$313	\$4,422	RSM HC-2004 P-150
9.		ENR Index Price Adjustment	17.5%		\$3,292							\$3,292	Adjustment for Concrete &
10.		Structure Subtotal			\$22,530			\$28,576	\$7,144	\$6,414		\$37,528	Est Judgement
11.		Elec & I&C % of Structure	25%	ls	\$5,634			\$31.04				\$12,778	
12.		Misc. Materials & Consumable	3%	%	\$72,845		146.0	\$31.04	\$4,533		\$7,392	\$84,770	
ST		2 x 24 mgd Design			\$2,591,215	5,014.1		\$162,771		\$253,806			

## CDS System

## MARK-UPS:

OVERHEAD =  
 PROFIT =  
 MOB/ORD/INS =  
 CONTINGENCY =

MATL	LABOR	EQUIP.
10.0%	10.0%	10.0%
5.0%	5.0%	5.0%
5.0%	5.0%	5.0%
25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MKE  
 Project Mgr: Webster, Todd/M  
 Project #: 316657  
 Estimate #: Conceptual / Alter  
 Rev. #: # 2  
 Estimate Date: 09/30/2004

Site 17	Alt / Size	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR		EQUIPMENT		TOTAL
	Alt #1		Cost		Marked-Up	UNIT \$	Unit	Man-Hrs	UNIT \$	AMOUNT	
CDS Site 17		Raked Bar Screen - 4mm Spacing	\$55,967		\$51,008						
1.		Raked Bar Screen	1.0	ea		\$38,000	106.25	106.3	\$3,800.00	\$3,800	\$45,098
2.	10 sq x 10'd	Excavate @ Equipment Structure	37	cy			0.29	10.8	\$3,395	\$5.65	\$557
3.		Structure Base Stone	7	cy		\$4.49	0.25	1.8	\$3,104	\$1.71	\$108
4.		Backfill / Vibrating Plate	30	cy			0.13	3.9	\$3,104	\$0.23	\$128
5.	8' x 8' x 1'	12" Slab on Grade	64	sf		\$2.89	0.03	1.7	\$3,104	\$0.01	\$237
6.		12" Walls, 10' High	12	cy		\$126.00	5.00	59.2	\$1,839	\$18.65	\$3,553
7.	8' x 8'	12" Concrete Roof	2.4	cy		\$199.00	5.41	12.8	\$3,104	\$19.35	\$821
8.	16 lf	12" Sq Beams	2	cy		\$233.00	12.8	30.4	\$3,104	\$48	\$1,608
9.		ENR Index Price Adjustment	17.5%			\$3,097			\$3,745	\$617	\$458
10.		Structure Subtotal				\$774					\$7,469
11.		Elec & I&C % of Structure	25%	ls							\$1,710
12.		Misc. Materials & Consumable	3%	%		\$1,266		6.8	\$3,104	\$211	\$1,600
ST		Raked Bar Screen - 4mm Spacing				\$43,127	233.7		\$8,190	\$4,550	

CDS Site 17	Alt #2	CDS-GSS - 1 mm Screening (200 micron effective)	Cost	Marked-Up							
1.		1 mm Screening	1.0	ea		\$80,000.00	171	171.1	\$3,104	\$5,309	\$83,309
2.		Automation	1	ea		\$75,000.00	123	123.4	\$3,104	\$3,828	\$78,828
3.	15x20 x 14'd	Excavate @ Equipment Structure	156	cy			0.28	45.3	\$3,104	\$1,405	\$2,315
4.		Structure Base Stone	22	cy		\$4.49	0.25	5.5	\$3,104	\$1.72	\$310
5.		Backfill / Vibrating Plate	133	cy			0.13	17.7	\$3,104	\$0.23	\$581
6.	10' x 15' x 1'	12" Slab on Grade		sf		\$2.89	0.03	0.3	\$3,104	\$0.01	
7.		12" Walls, 12' HIGH		cy		\$126.00	5.00		\$3,104	\$18.65	
8.	10' x 15' x 1'	12" Concrete Roof		cy		\$159.00	5.41		\$3,104	\$19.35	
9.	20 lf	12" Sq Beams		cy		\$233.00	12.8		\$3,104	\$48	
10.		ENR Index Price Adjustment	17.5%			\$100			\$2,127	\$979	
11.		Structure Subtotal		ls		\$1,708					\$2,745
12.		Elec & I&C % of Structure	45%	ls		\$3,874.00	17.14	17.1	\$3,104	\$530	\$4,406
13.		20 hp Pump	1	ea		\$4,823					\$5,446
ST		CDS-GSS - 1 mm Screening (200 micron effective)				\$165,585	391.5		\$13,108	\$9,248	

CDS System

MARK-UPS:

OVERHEAD =  
PROFIT =  
MOB/ON/INS. =  
CONTINGENCY =

MATL	LABOR	EQUIP.
10.0%	10.0%	10.0%
5.0%	5.0%	5.0%
5.0%	5.0%	5.0%
25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MKE  
Project Mgr: Webster, Todd/M  
Project #: 316657  
Estimate #: Conceptual / Alter  
Rev. #: # 2  
Estimate Date: 09/30/2004

Site 17	Alt / Size	DESCRIPTION	QTY		UNIT	MATERIALS		LABOR		Equipment		TOTAL
						UNIT \$	AMOUNT	Unit	Man-Hrs	UNIT \$	AMOUNT	
CDS Site 17 Alt #3 CDS-FSS Chemically Enhanced Flocculation w/ 1mm Screens			Cost			Marked-up						
					\$535,395	\$776,323						
1.	30 x 50 x 17'd	1 mm Screening	1.0	ea		\$350,000.0		748.4	\$31.04	\$23,227	\$35,000.00	\$408,227
3.		Excavate @ Equipment Structure	944	cy				0.29	\$31.04	\$8,530	\$5.85	\$14,059
4.		Structure Base Stone	73	cy		\$4.49		0.25	\$31.04	\$567	\$1.71	\$1,021
5.		Backfill / Vibrating Plate	871	cy				0.13	\$31.04	\$3,596	\$0.23	\$3,798
6.	22' x 45' x 1'	12" Slab on Grade	990	sf		\$2.89		0.03	\$31.04	\$795	\$0.01	\$1,021
7.		12" Walls, 14" HIGH	69	cy		\$126.00		5.00	\$31.04	\$10,781	\$18.65	\$20,831
8.	22' x 45' x 1'	12" Concrete Roof	36.7	cy		\$159.00		5.41	\$31.04	\$6,157	\$19.35	\$12,686
9.	44 lf	12" Sq Beams	7	cy		\$233.00		12.8	\$31.04	\$2,591	\$48	\$4,422
10.	\$427	ENR Index Price Adjustment	17.5%									\$3,319
11.		Structure Subtotal				\$22,613			\$33,020		\$8,179	\$33,191
12.		Elec & I&C % of Structure	25%	ls		\$5,653				\$8,255		\$13,908
13.		5 hp Pump	1	ea		\$2,210.00		10.67	\$31.04	\$331		\$2,541
14.		20 hp Pump	1	ea		\$3,874.00		17.1	\$31.04	\$532		\$4,406
15.		Control Bldg	225	sf		\$112.00		0.15	\$31.04	\$1,048	\$4.00	\$27,148
		Misc. Materials & Consumable	3%	%		\$12,286		56.2	\$31.04	\$1,745		\$15,354
ST		CDS-FSS Chemically Enhanced Flocculation w/ 1mm Screens				\$421,835		1,930.0		\$58,158	\$45,401	

# CDS System

MARK-UPS:

OVERHEAD =

PROFIT =

MOB/DI/INS. =

CONTINGENCY =

MATL	LABOR	EQUIP.
10.0%	10.0%	10.0%
5.0%	5.0%	5.0%
5.0%	5.0%	5.0%
25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MKE

Project Mgr: Webster, Todd/M

Project #: 316657

Estimate #: Conceptual / All

Rev. #: # 2

Estimate Date: 09/30/2004

Site 17	Alt / Size	DESCRIPTION	QTY	UNIT	MATERIALS	LABOR	EQUIPMENT	TOTAL
					UNIT \$	Man-Hrs	UNIT \$	
CDS Site 21	Alt #2	CDS-GSS - 1 mm Screening (200 micron effective)	Cost		Marked-up			
			\$188,513		\$273,344			
1.		1 mm Screening	1.0	ea	\$80,000.00	171	\$8,000.00	\$88,000
2.		Automation	1	ea	\$75,000.00	123	\$3,825	\$78,825
3.	20 sq x 12d	Excavate @ Equipment Structure	178	cy		51.7	\$5.65	\$1,040
4.		Structure Base Stone	22	cy	\$4.49	5.5	\$1.71	\$38
5.		Backfill / Vibrating Plate	156	cy		0.13	\$0.23	\$30
6.	10' x 15' x 1'	12" Slab on Grade		sf	\$2.89	0.03	\$0.01	\$3
7.	12" Walls, 12' FOOT HIGH			cy	\$126.00	5.00	\$16.65	\$630
8.	10' x 15' x 1'	12" Concrete Roof		cy	\$159.00	5.41	\$19.35	\$756
9.	20 lf	12" Sq Beams		cy	\$233.00	12.6	\$48	\$1,114
10.		ENR Index Price Adjustment	17.5%					
11.		Structure Subtotal	45%	ls	\$1,788		\$1,089	\$2,877
12.		Elec & I/C % of Structure	1	ea	\$3,874.00	17.14	\$31.04	\$552
13.		20 hp Pump	3%	%	\$4,823		\$31.04	\$363
ST		Misc. Materials & Consumable				407.2	\$13,541	\$9,387
		CDS-GSS - 1 mm Screening (200 micron effective)			\$165,585			

CDS Site 21		Alt #3	CDS-FSS Chemically Enhanced Flocculation w/ 1mm Screens		Cost	Marked-up							
					\$550,507	\$812,880							
1.	1mm Screening	1.0	ea	\$350,000.0	\$350,000	748	748.4	\$31.04	\$23,227	\$35,000.00	\$35,000	\$408,227	Vendor Quote
3.	40 x 60 x 15d	1,333	cy			0.29	398.0	\$31.04	\$12,043	\$5.85	\$7,800	\$19,843	RSM Bldg-04
4.	Structure Base Stone	111	cy	\$4.49	\$499	0.25	27.7	\$31.04	\$859	\$1.71	\$190	\$1,548	RSM Bldg-04
5.	Backfill / Vibrating Plate	1,222	cy			0.13	162.6	\$31.04	\$5,045	\$0.23	\$281	\$5,326	RSM Bldg-04
6.	30' x 50' x 1'	1,500	sf	\$2.89	\$4,335	0.03	39.0	\$31.04	\$1,210	\$0.01	\$15	\$5,560	RSM HC-2004
7.	12" Slab on Grade	74	cy	\$126.00	\$9,333	5.00	370.3	\$31.04	\$11,493	\$18.65	\$1,381	\$22,208	RSM HC-2004
8.	12" Walls, 12' FOOT HIGH	55.6	cy	\$159.00	\$8,839	5.41	300.6	\$31.04	\$9,328	\$19.35	\$1,075	\$19,237	RSM HC-2004
9.	30' x 50' x 1'	9	cy	\$233.00	\$2,071	12.8	113.8	\$31.04	\$3,533	\$48	\$427	\$6,030	RSM HC-2004
10.	60 lf	17.5%										\$4,300	Adjustment for (
11.	ENR Index Price Adjustment												\$84,053
12.	Structure Subtotal			\$29,372				\$43,512		\$11,169			Est. Judgement
13.	Elec & I&C % of Structure	25%	ls	\$7,343					\$10,878			\$18,221	RSM Mech
14.	5 hp Pump	1	ea	\$2,210.00	\$2,210	10.67	10.7	\$31.04	\$331			\$2,541	RSM Mech
15.	15 hp Pump	1	ea	\$3,874.00	\$3,874	17.14	17.1	\$31.04	\$532			\$4,406	RSM Mech
	Control Bldg	225	sf	\$112.00	\$25,200	0.15	33.8	\$31.04	\$1,048	\$4.00	\$900	\$27,148	RSM Bldg-04
	Misc. Materials & Consumable	3%	%		\$12,540		66.4	\$31.04	\$2,059		\$1,412	\$16,012	
ST	CDS-FSS Chemically Enhanced Flocculation w/ 1mm Screens			\$430,539		2,278.2		\$81,557			\$46,451		

OVERHEAD =  
PROFIT =  
MOB/BOND/INS. =  
CONTINGENCY =

Estimator: Wm. Griffith / MKE  
Project Mgr: Webster, Todd/Mt  
Project #: 316657  
Estimate #: Conceptual / Alter  
Rev. #: # 2  
Estimate Date: 09/30/2004

MATL	LABOR	EQUIP.
10.0%	10.0%	10.0%
5.0%	5.0%	5.0%
5.0%	5.0%	5.0%
25.0%	25.0%	25.0%

Site 17	Alt / Size	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR		Equipment		TOTAL	
					UNIT \$	AMOUNT	Unit MH	Man-Hrs	UNIT \$	AMOUNT		
CDS Site 26			Cost		Marked-up							
Alt #1	Raked Bar Screen - 4mm Spacing		\$90,485		\$131,218							
1.		Raked Bar Screen	1.0	ea	\$65,000.00		181.74	181.7	\$31.04	\$5,641	\$6,500.00	\$77,141
2.	10' X 10' X 12'	Excavate @ Equipment Structure	89	cy			0.29	25.9	\$31.04	\$803	\$5.85	\$1,323
3.		Structure Base Stone	7	cy	\$33	\$4.49	0.25	1.8	\$31.04	\$77	\$1.71	\$13
4.		Backfill / Vibrating Plate	81	cy			0.13	10.8	\$31.04	\$336	\$0.23	\$19
5.	3.5' X 17.33'	12" Slab on Grade	72	sf	\$2.89		0.03	1.9	\$31.04	\$58	\$0.01	\$1
6.		12" Walls, 10' High	15	cy	\$126.00		5.00	77.1	\$31.04	\$2,384	\$16.65	\$288
7.	8' x 8'	12" Concrete Roof	2.4	cy	\$169.00		5.41	12.8	\$31.04	\$398	\$19.35	\$46
8.	8 lf	12" Sq Beams	1	cy	\$233.00		12.8	15.2	\$31.04	\$471	\$4.8	\$57
9.	\$406	ENR Index Price Adjustment	17.5%		\$491							\$804
10.		Structure Subtotal			\$3,229				\$4,518		\$343	\$491
11.		Elec & I&C % of Structure	25%	ls	\$832				\$31.04	\$1,129		\$1,962
12.		Misc. Materials & Consumable	3%	%	\$2,075		337.1	9.8	\$31.04	\$305		\$2,803
ST		Raked Bar Screen - 4mm Spacing			\$71,237				\$11,593	\$7,666		\$2,803
												Vendor Quote
												RSM Bldg-04
												\$103
												RSM Bldg-04
												\$355
												RSM Bldg-04
												\$267
												RSM HC-2004
												\$4,626
												RSM HC-2004
												\$821
												RSM HC-2004
												\$804
												RSM HC-2004
												\$491
												Adjustment for C
												\$8,790
												Est. Judgement
												\$1,962

CDS Site 26		Alt #2	CDS-GSS - 1 mm Screening (200 micron effective)		Cost	Marked-up						
					\$509,379	\$738,399						
1.	1 mm Screening Automation	1.0 ea	\$300,000.00	\$300,000.00	641	641.4	\$31.04	\$19,909	\$30,000.00	\$30,000	\$349,909	Vendor Quote
2.	40 X 30' x 14'd Excavate @ Equipment Structure	1 ea	\$110,000.00	\$110,000.00	181	180.9	\$31.04	\$5,615	\$5,615		\$115,615	Vendor Quote
3.	Structure Base Stone	622 cy			0.29	181.1	\$31.04	\$5,620	\$5,620	\$5.85	\$9,260	RSM Bldg-04
4.	Backfill / Vibrating Plate	89 cy	\$4.49	\$399	0.25	22.1	\$31.04	\$887		\$1.71	\$1,238	RSM Bldg-04
5.	30' x 18' x 1' 12" Slab on Grade	533 cy			0.13	70.9	\$31.04	\$2,202	\$0.23	\$128	\$2,324	RSM Bldg-04
6.	12" Walls, 12' FOOT HIGH	500 cy	\$2.89	\$126.00	5.00		\$31.04		\$0.01			RSM HC-2004
7.	12" Concrete Roof	5.41 cy	\$159.00	\$233.00	12.8		\$31.04		\$18.65			RSM HC-2004
8.	12" Sq Beams	17.5%					\$31.04		\$19.35			RSM HC-2004
9.	ENR Index Price Adjustment		\$339					\$8,509		\$3,915		Adjustment for (
10.	Structure Subtotal											\$12,922
11.	Elec & I&C % of Structure	45%										Est Judgement
12.	20 hp Pump	2 ea	\$3,874.00		17.14	34.3	\$31.04	\$1,064			\$7,495	RSM Mech
13.	Misc. Materials & Consumable	3% %										\$6,812
ST	CDS-GSS - 1 mm Screening (200 micron effective)		\$435,488		1,154.7			\$38,979		\$34,932	\$44,725	

CDS System

MARK-UPS:

OVERHEAD =  
PROFIT =  
MOBOND/INS. =  
CONTINGENCY =

MATL	LABOR	EQUIP.
10.0%	10.0%	10.0%
5.0%	5.0%	5.0%
5.0%	5.0%	5.0%
25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MKE  
Project Mgr: Webster, Todd/MH  
Project #: 316657  
Estimate #: Conceptual / Alter  
Rev. #: # 2  
Estimate Date: 09/30/2004

Site 17	Alt / Site	DESCRIPTION	QTY	UNIT	MATERIALS	LABOR	EQUIPMENT	TOTAL
					UNIT \$	Man-Hrs	UNIT \$	
CDS Site 26 Alt #3 CDS-FSS Chemically Enhanced Flocculation w/ 1mm Screens					Marked-up \$1,743,233			
Cost \$1,202,230								
1.	70 X 80 x 20'd	1 mm Screening	1.0	ea	\$750,000.00	1,604	\$49,773	\$75,000
2.		Excavate @ Equipment Structure	4,148	cy		0.29	\$31.04	\$24,297
3.		Structure Base Stone	415	cy	\$1,863	0.25	\$31.04	\$709
4.		Backfill / Vibrating Plate	3,733	cy	\$4.49	0.13	\$31.04	\$859
5.	61' X 70' X 20'd	12" Slab on Grade	4,270	sf	\$2.89	0.03	\$31.04	\$15,411
6.		12" Walls, 20' FOOT HIGH	194	cy	\$122.00	4.09	\$31.04	\$24,661
7.	61' x 70' x 1'	12" Concrete Roof	158.1	cy	\$159.00	5.41	\$31.04	\$26,555
8.	122 lf	12" Sq Beams	18	cy	\$233.00	12.8	\$31.04	\$7,193
9.		ENR Index Price Adjustment	17.5%		\$11,440			\$868
10.		Structure Subtotal			\$78,677		\$117,928	\$32,765
11.		Elec & I&C % of Structure	15%	ls	\$11,802			\$17,698
13.		5 hp Pump	1	ea	\$2,210.00	10.67	\$31.04	\$331
14.		15 hp Pump	1	ea	\$3,874.00	17.14	\$31.04	\$532
15.		Control Bldg	225	sf	\$112.00	0.15	\$31.04	\$1,048
		Misc. Materials & Consumable	3%	%	\$26,153	163.9	\$31.04	\$5,088
ST		CDS-FSS Chemically Enhanced Flocculation w/ 1mm Screens			\$897,916	5,628.6	\$192,389	\$111,925
								\$29,491
								\$2,541
								\$4,408
								\$27,148
								\$34,501
								\$11,440
								\$229,370
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								\$32,765
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								\$11,440
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								\$32,765
								\$29,491
								\$2

# CDS System

MARK-UPS:

OVERHEAD =  
PROFIT =  
MOBONDINGS =  
CONTINGENCY =

MATL	LABOR	EQUIP.
10.0%	10.0%	10.0%
5.0%	5.0%	5.0%
5.0%	5.0%	5.0%
25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MK3  
Project Mgr: Webster, Todd/MH  
Project #: 316657  
Estimate #: Conceptual / Alter  
Rev. #: # 2  
Estimate Date : 09/30/2004

Site 17	Alt / Size	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR		EQUIPMENT		TOTAL
					UNIT \$	AMOUNT	Unit	Man-Hrs	UNIT \$	AMOUNT	
CDS Site 52 Alt #2 CDS-GSS - 1mm Screening (200 micron effective)					Marked-up	\$235,498					
			Cost			\$162,413					
1.	1mm Screening Automation	1.0 ea			\$60,000.00	\$60,000.00	128	128.3	\$31.04	\$3,982	\$69,982
2.	15' X 17' x 13' Excavate @ Equipment Structure	1 ea			\$75,000.00	\$75,000.00	123	123.4	\$31.04	\$3,829	\$78,829
3.	Structure Base Stone	123 cy					0.29	35.7	\$31.04	\$1,109	\$1,827
4.	Backfill / Vibrating Plate	19 cy			\$4.49	\$85	0.25	4.7	\$31.04	\$146	\$263
5.	10' x 12' x 1' 12" Slab on Grade	104 cy					0.13	13.8	\$31.04	\$428	\$453
6.	12" Walls, 12' FOOT HIGH	sf			\$2.89		0.03		\$31.04	\$0.01	
7.	12" Concrete Roof	cy			\$126.00		5.00		\$31.04	\$16.65	
8.	20' If 12" Sq Beams	cy			\$159.00		5.41		\$31.04	\$19.35	
9.	#DIV01 ENR Index Price Adjustment	17.5%			\$233.00		12.8		\$31.04	\$4.8	
10.	Structure Subtotal				\$85					\$7.74	
11.	Elec & I&C % of Structure	45% Is			\$1,618					\$798	
12.	12-15 hp Pump	1 ea			\$3,510.00	\$3,510.00	15.00	15.0	\$31.04	\$466	\$2,375
13.	Misc. Materials & Consumable	3% %			\$4,208					\$298	\$3,976
ST	CDS-GSS - 1mm Screening (200 micron effective)				\$144,419		320.5		\$31.04	\$203	\$4,708
									\$11,016	\$5,078	

Vendor Quote	\$89,982
Vendor Quote	\$78,829
RSM Bldg-04	\$1,827
RSM Bldg-04	\$263
RSM Bldg-04	\$453
RSM HC-2004	
RSM HC-2004	
RSM HC-2004	
RSM HC-2004	
Adjustment for (	
\$2,543	
Est Judgement	\$2,375
RSM Mech	\$3,976
	\$4,708

Site 52	Alt #3	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR		EQUIPMENT		TOTAL
					UNIT \$	AMOUNT	Unit	Man-Hrs	UNIT \$	AMOUNT	
CDS Site 52 Alt #3 CDS-FSS Chemically Enhanced Flocculation w/ 1mm Screens					Marked-up	\$560,324					
			Cost			\$386,430					
1.	1mm Screening	1.0 ea			\$250,000.00	\$250,000.00	535	534.5	\$31.04	\$16,591	\$266,591
2.	26' X 40' x 14' Excavate @ Equipment Structure	539 cy					0.29	156.9	\$31.04	\$4,871	\$271,462
3.	Structure Base Stone	56 cy			\$4.49	\$252	0.25	14.0	\$31.04	\$435	\$256,814
4.	Backfill / Vibrating Plate	483 cy					0.13	64.2	\$31.04	\$1,994	\$258,808
5.	12' Slab on Grade	735 sf			\$2.89	\$2,124	0.03	18.1	\$31.04	\$593	\$2,717
6.	12" Walls, 12' FOOT HIGH	50 cy			\$122.00	\$6,100	4.09	203.8	\$31.04	\$6,325	\$12,725
7.	12" Concrete Roof	27.2 cy			\$159.00	\$4,328	5.41	147.3	\$31.04	\$4,571	\$13,157
8.	42' If 12" Sq Beams	6 cy			\$233.00	\$1,458	12.8	79.7	\$31.04	\$2,479	\$9,428
9.	ENR Index Price Adjustment	17.5%			\$2,446					\$4.8	\$4,221
10.	Structure Subtotal				\$16,673					\$21,251	\$2,448
11.	Elec & I&C % of Structure	15% Is			\$2,501					\$3,188	\$5,690
12.	12-15 hp Pump	2 ea			\$3,510.00	\$7,020	15.00	30.0	\$31.04	\$931	\$7,951
13.	Control Bldg	225 sf			\$112.00	\$25,200	0.15	33.8	\$31.04	\$1,048	\$27,148
	Misc. Materials & Consumable	3% %			\$9,042					\$1,195	\$11,162
ST	CDS-FSS Chemically Enhanced Flocculation w/ 1mm Screens				\$310,436		1,321.8		\$31.04	\$44,215	\$351,779

Vendor Quote	\$291,591
RSM Bldg-04	\$8,025
RSM Bldg-04	\$783
RSM Bldg-04	\$2,105
RSM HC-2004	\$2,725
RSM HC-2004	\$13,157
RSM HC-2004	\$9,428
RSM HC-2004	\$4,221
Adjustment for (	
\$42,888	
Est Judgement	\$5,690
RSM Mech	\$7,951
RSM Bldg-04	\$27,148
	\$11,162

Operations & Maintenance

MARK-UPS:

OVERHEAD :  
PROFIT :  
MOBONDING :  
CONTINGENCY :

MATL	LABOR	EQUIP.	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

Estimator: Wm. Griffin / MKE  
Project Mgr: Webster, Todd/MKE  
Project #: 316657  
Estimate #: Conceptual / Alternatives  
Rev. #: # 3  
Estimate Date : 10/02/2004

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS UNIT \$	LABOR Unit Man-Hrs	RATE	AMOUNT	EQUIPMENT UNIT \$	AMOUNT	TOTAL	RESOURCE
<b>1 Alternate Vendor CDS - Raked Bar Screen</b>												
1	1	Screen	Cost		Marked-up							
			\$257		\$372							
1.	1.	2 person crew	4.0	hrs		1	4.0	\$124		\$124		2 person crew 4 hrs per trip
2.	1.	Vehicles / fuel	1.0	Trips				\$31.04	\$100.00	\$100		50k truck x .25% / 100trips = trip unit @ 80%
3.	1.	Utilities / Power						\$31.04				
4.	1.	Equipment Replacement						\$31.04				
5.	1.	Veg Oil	1	ea	\$25.00			\$25		\$25		
6.	1.							\$31.04				
7.	1.	Misc. Materials & Consumable	3%	%	\$1		0.1	\$31.04	\$4	\$7		
ST		Alternate Vendor CDS - Raked Bar Screen			\$26	4.1		\$128	\$103	\$7		

<b>4 Alternate Vendor CDS Type GSS</b>												
1	4	Alternate Vendor CDS	Cost		Marked-up							
			\$1,814		\$2,630							
1.	4.	2 person crew	4.0	hrs		1	16.0	\$497		\$497		2 person crew 4 hrs per trip
2.	4.	Vehicles / fuel	1.0	ea				\$31.04	\$400	\$400		50k truck x .25% / 100trips = trip unit @ 80%
3.	4.	Utilities / Power	1	ea	\$500.00			\$31.04		\$500		Est. Judgement/Allowance
4.	4.	Equipment Replacement	1	ea	\$60.00		4.0	\$124		\$364		Est. Judgement/Allowance
5.	4.	Chemicals						\$31.04				
6.	4.							\$31.04				
7.	4.	Misc. Materials & Consumable	3%	%	\$22		0.6	\$31.04	\$19	\$53		
ST		Alternate Vendor CDS Type GSS			\$762	20.6		\$639	\$412	\$53		

<b>6 Alternate Vendor CDS Type FSS</b>												
1	6	Alternate Vendor CDS	Cost		Marked-up							
			\$3,048		\$4,419							
1.	3.	2 person crew	4.0	hrs		1	24.0	\$745		\$745		2 person crew 4 hrs per trip
2.	3.	Vehicles / fuel	1.0	ea				\$31.04	\$600	\$600		50k truck x .25% / 100trips = trip unit @ 80%
3.	3.	Utilities / Power	1	ea	\$650.00			\$31.04		\$650		Est. Judgement/Allowance
4.	3.	Equipment Replacement	1	ea	\$65.00		4.0	\$124		\$514		Est. Judgement/Allowance
5.	3.	Chemicals	1	ea	\$75.00			\$31.04		\$450		Est. Judgement/Allowance
6.	3.							\$31.04				
7.	3.	Misc. Materials & Consumable	3%	%	\$45		0.8	\$31.04	\$26	\$89		
ST		Alternate Vendor CDS Type FSS			\$1,535	28.8		\$895	\$618	\$89		

<b>1 Alternate Vendor KRUGER1</b>												
2	1	Alternate Vendor KRUGER1	Cost		Marked-up							
			\$231		\$335							
1.	1.	2 person crew	4.0	hrs		1	4.0	\$124		\$124		2 person crew 4 hrs per trip
2.	1.	Vehicles / fuel	1.0	Trips				\$31.04	\$100.00	\$100		50k truck x .25% / 100trips = trip unit @ 80%

Operations & Maintenance

MARK-UPS:

OVERHEAD :  
PROFIT :  
MOB/OND/INS :  
CONTINGENCY :

MATL	LABOR	EQUIP	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

Estimator: Wm. Giffith / MKE  
Project Mgr: Webster, Todd/MKE  
Project #: 316657  
Estimate #: Conceptual / Allmaterials  
Rev. #: # 3  
Estimate Date : 10/02/2004

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR		RATE	AMOUNT	Equipment		TOTAL	RESOURCE
					UNIT \$	AMOUNT	Unit	Man-Hrs			UNIT \$	AMOUNT		
3.	1.	Utilities / Power							\$31.04					
4.	1.	Equipment Replacement							\$31.04					
5.	1.	Chemicals							\$31.04					
6.	1.								\$31.04					
7.	1.	Misc. Materials & Consumable	5%	%				0.1	\$31.04	\$4			\$7	
ST		Alternate Vendor KRUGERI					4.1		\$31.04	\$128	\$103			

Cost Marked-up

Operations & Maintenance

MARK-UPS:

OVERHEAD :  
PROFIT :  
MOBILIZATION :  
CONTINGENCY :

MATL	LABOR	EQUIP.	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

Estimator: Wm. Griffith / MKE  
Project Mgr: Webster, Todd/MKE  
Project #: 316657  
Estimate #: Conceptual / Alternatives  
Rev. #: # 3  
Estimate Date : 10/02/2004

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR		EQUIPMENT		TOTAL	RESOURCE
					UNIT \$	AMOUNT	Unit	Man-Hrs	UNIT \$	AMOUNT		
3	4	Alternate Vendor GRANDE	\$1,439		\$2,085							
1.	4.	2 person crew	4.0	hrs			1	16.0			\$497	2 person crew 4 hrs per trip
2.	4.	Vehicles / fuel	1.0	Trip					\$100.00	\$400	\$400	50k truck x .25% / 100trips = trip unit @ 80%
3.	4.	Utilities / Power										
4.	4.	Equipment Replacement										
5.	4.	Chemicals										
6.	4.	Fluids	1		\$125.00	\$500					\$500	
7.	4.	Misc. Materials & Consumable	3%	%				0.5		\$512	\$12	
ST		Alternate Vendor GRANDE			\$515		16.5		\$442		\$42	

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR		EQUIPMENT		TOTAL	RESOURCE
					UNIT \$	AMOUNT	Unit	Man-Hrs	UNIT \$	AMOUNT		
4	1	Alternate Vendor Fresh Creek Tech	\$1,088		\$1,578							
1.	1.	2 person crew	8.0	hrs			2	16.0			\$497	2 person crew 4 hrs per trip
2.	1.	Vehicles / fuel	1.0	Trip					\$100.00	\$100	\$100	50k truck x .25% / 100trips = trip unit @ 80%
3.	1.	Utilities / Power										
4.	1.	Equipment Replacement	1	ea	\$125.00	\$125					\$125	
5.	1.	Chemicals										
6.	1.											
7.	1.	Misc. Materials & Consumable	3%	%				0.5		\$512	\$13	
ST		Alternate Vendor Fresh Creek Tech			\$129		16.5		\$448		\$32	

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR		EQUIPMENT		TOTAL	RESOURCE
					UNIT \$	AMOUNT	Unit	Man-Hrs	UNIT \$	AMOUNT		
4	4	Alternate Vendor Parkson Corp	\$3,421		\$4,961							
1.	4.	2 person crew	8.0	hrs			2	64.0			\$1,986	2 person crew 4 hrs per trip
2.	4.	Vehicles / fuel	1.0	Trip					\$100.00	\$400	\$400	50k truck x .25% / 100trips = trip unit @ 80%
3.	4.	Utilities / Power	1	ea	\$25.00	\$25					\$25	
4.	4.	Equipment Replacement	1	ea	\$125.00	\$500					\$500	
5.	4.	Chemicals										
7.	4.	Misc. Materials & Consumable	3%	%				1.9		\$2,046	\$22	
ST		Alternate Vendor Parkson Corp			\$618		65.9		\$757		\$100	

Operations & Maintenance

MARK-UPS:

OVERHEAD :  
PROFIT :  
MOBONDINGS :  
CONTINGENCY :

MATL	LABOR	EQUIP.	Indirects
10.0%	10.0%	10.0%	10.0%
5.0%	5.0%	5.0%	5.0%
5.0%	5.0%	5.0%	5.0%
25.0%	25.0%	25.0%	25.0%

Estimator: Wm. Griffin / MKE  
Project Mgr: Webster, Todd/MKE  
Project #: 316657  
Estimate #: Conceptual / Alternatives  
Rev. #: # 3  
Estimate Date : 10/02/2004

Item	CSI Div	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR Unit MH	Man-Hrs	EQUIPMENT		TOTAL	RESOURCE
					UNIT \$	AMOUNT			UNIT \$	AMOUNT		
5	1	Comments	\$231									
1.	1.	2 person crew	4.0	hrs			1	4.0			\$124	2 person crew 4 hrs per trip
2.	1.	Vehicles / fuel	1.0	Trip					\$100.00	\$100	\$100	50k truck x .25% / 100trips = trip unit @ 40%
3.	1.	Utilities / Power										
4.	1.	Equipment Replacement										
5.	1.	Chemicals										
6.	1.											
7.	1.	Misc. Materials & Consumable	3%	%				0.1		\$4	\$128	
ST		Comments					4.1			\$103	\$7	

**Appendix E**  
**Application of the Setback Rule to**  
**CSO Projects (draft)**

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## Application of the Setback Rule to CSO Projects

### DRAFT FOR DISCUSSION PURPOSES

8/13/04

Communities in the process of developing Combined Sewer Overflow (CSO) Long Term Control Plans have requested that IDEM provide an interpretation of the setback requirement found in 327 IAC 3-2-6, particularly as applied to the construction of CSO treatment/control projects. These communities have indicated that the applicability of this requirement may impact their evaluation/selection of long term CSO controls.

327 IAC 3-2-6 states:

- (a) Setback distances for **new wastewater treatment sites** must comply with the following:
  - (1) No less than five hundred (500) feet shall separate a water pollution treatment/control facility, including aerated lagoon systems, from a dwelling, unless that dwelling is an office owned, occupied by, and located on the property of the owners of the water pollution treatment/control facility, as measured from the outside edge of the equipment involved with the treatment/control of water pollution to the outside edge of the dwelling.
  - (2) No less than one-fourth (1/4) of a mile shall separate a nonaerated facultative treatment lagoon from a dwelling, unless that dwelling is an office owned, occupied by, and located on the property of the owners of the nonaerated facultative treatment lagoon, as measured from the outside edge of the nonaerated facultative treatment lagoon to the outside edge of the dwelling.
- (b) The separation distances required in subsection (a) may be modified if the affected dwelling owners agree to a shortened separation distance and record such agreement as easements and deed restrictions with the county recorder's office for the affected property.

327 IAC 3-2-6 (emphasis added).

A community proposing to construct *a wastewater treatment/control device at a new wastewater treatment site* is subject to the requirements of this rule. While there is no legal definition of the phrase "new wastewater treatment site," IDEM considers it to mean a location at which:

- 1) wastewater treatment is not currently provided; and

- 2) construction of a wastewater treatment device is proposed as part of the project for which a construction permit is being sought.

Examples of the application of this rule, in the context of the proposed construction of CSO storage or treatment projects, include the following:

Construction of a "Satellite" Basin: A community proposing to construct a basin in order to store wastewater for future conveyance to a wastewater treatment plant is not subject to the 500' setback requirement, as long as the basin is not designed to overflow to the environment/waters of the state. The setback requirement applies to construction of a water pollution treatment/control device occurring at a new wastewater treatment site. A new wastewater treatment site is a location at which wastewater treatment is not currently provided and construction of a wastewater treatment device is proposed. A basin designed solely for the purpose of storage is not considered to be a wastewater treatment device. Accordingly, construction of such a basin does not constitute construction at a new wastewater treatment site, and therefore, the setback requirement is not applicable.

Construction of "End-of-Pipe" Treatment at an Existing CSO outfall: A community proposing to construct "end-of-pipe" treatment at an existing CSO outfall, where no treatment is currently provided, is subject to the 500' setback requirement. The setback requirement applies to construction of a water pollution treatment/control device occurring at a new wastewater treatment site. A new wastewater treatment site is a location at which wastewater treatment is not currently provided and construction of a wastewater treatment device is proposed. The installation of treatment at a location at which treatment is not currently provided constitutes construction at a new wastewater treatment site, and therefore, the setback requirement is applicable.

Construction of "Satellite" Disinfection Facilities and an Equalization Basin: A community proposing to construct satellite disinfection facilities, and an equalization basin to equalize the flows transported to the satellite disinfection facilities, at a location at which treatment is not currently provided, is subject to the 500' setback requirement with respect to both the disinfection facilities and the equalization basin. The setback requirement applies to construction of water pollution treatment/control devices occurring at a new wastewater treatment site. A new wastewater treatment site is a location at which wastewater treatment is not currently provided and construction of a wastewater treatment device is proposed. The construction of disinfection facilities at a location at which treatment is not currently provided constitutes construction at a new wastewater treatment site, and therefore, the setback requirement applies to the construction of the disinfection facilities. Further, the equalization basin is a water pollution treatment/control device proposed to be constructed at a new wastewater treatment site, and therefore, the setback requirement is applicable to it as well.

A community that is seeking to construct a water pollution treatment/

control device at a new wastewater treatment site, and is therefore subject to the 500' setback requirement, may be permitted to utilize a shorter separation distance if the requirements of 327 IAC 3-2-6(b) are satisfied. A community that is unable to satisfy the requirements of 327 IAC 3-2-6(b) should consider acquiring, through eminent domain, the property or easement needed to comply with the setback requirement. Alternatively, a community that is unable to meet the 500' setback requirement, and unable to satisfy the requirements of 327 IAC 3-2-6(b), may be able to obtain a variance, pursuant to IC 13-14-8-8, from the 500' setback requirement.

Regardless of whether the setback requirement is applicable, communities should consider both satellite storage and satellite/end-of pipe treatment for CSO discharges in their evaluation of alternatives, in order to ensure that an evaluation of a full range of alternatives is conducted. Additionally, information generated during the evaluation of alternatives could help support a request for variance from the setback requirement.

Furthermore, it should be noted that regardless of whether the setback requirement is applicable, the construction of any water pollution treatment/control device requires a construction permit from IDEM, in accordance with 327 IAC 3, unless an exclusion contained in 327 IAC 3-2-4 applies. In all of the above noted examples, a construction permit would be required.



## **Nine Minimum Controls – No. 6**

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### **EXHIBIT F-3**

## Report Clarification

TO: Pat Callahan/City of Fort Wayne

FROM: Todd Webster/CH2M HILL - Fort Wayne  
Rita Fordiani/CH2M HILL - Sudbury

DATE: November 22, 2004

The following excerpt is from the EPA CSO Guidance for Nine Minimum Controls (EPA 832-B-95-003), Control of Solid and Floatable Materials in CSOs – Documentation:

*The following list provides examples of documentation that could be submitted to demonstrate diligent effort in evaluating this minimum control, and a clear understanding of the measures being implemented:*

- *An engineering evaluation of procedures or technologies considered for controlling solid and floatable materials*
- *A description of CSO controls in place for solid and floatable materials*
- *A cost estimate and implementation schedule for each control measures being implemented*
- *An estimate of the decrease in solids and floatables expected from the minimum control efforts*
- *Documentation of any additional controls to be installed or implemented*

This memo documents a response to each of the above points.

### Engineering Evaluation of Procedures/Technologies Considered

This was provided in the November Report entitled, *City of Fort Wayne CSO Solids and Floatables Control Plan for Selected Sites*, CH2M HILL November 2004 (November Report).

### Description of CSO Controls in Place

This was provided in the November Report and highlights the many non-structural programs currently in place which prevent solids and floatables from reaching surface waters.

### Cost Estimate and Implementation Schedule

This was provided in the November Report for structural controls. As recommended in the report, thorough tracking of the costs and benefits of the non-structural programs would provide the data needed to evaluate program effectiveness.

### Estimate of the Decrease in Solids and Floatables

Tables 2-5 of the November Report provide an estimate of the decrease in solids and floatables as a result of non-structural programs. Table 8 of the November Report provides

an estimate of the decrease in solids and floatables as a result of future structural programs based on typical CSO discharge quality. However, the sites in Fort Wayne did not exhibit typical CSO quality. As presented in a memorandum, *City of Fort Wayne Recommended CSO Sites for Further Solids and Floatables Investigation*, July 23, 2004, CH2M HILL (July Memo), a majority of the CSO discharge sites were relatively free of sewer-related debris (see field notes and photos in the July Memo). For this reason the recommendations in the November Report focus more on maintaining better documentation of existing non-structural programs currently in place and implementing one structural control at Fairfax/Foster Park (Site #21) as a pilot program to better evaluate the cost-effectiveness of the non-structural and structural controls, respectively, before large financial commitments are made by the City.

### **Documentation of Any Additional Controls**

This was provided in the November Report.

## **Nine Minimum Controls – No. 6**

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### **EXHIBIT F-4**

## **Status of Follow Up Investigations**

Items Noted in “City of Fort Wayne Recommended CSO Sites for Further Solids and Floatables Investigation” dated July 23, 2004

**Date: 5-07**

### **Overflow Point No. 004**

**Comment in Report:** Suggest reviewing/correcting operation of tide flex – river backs into system at a high rate.

**Action Status:** Field investigation revealed that “duck bill” at discharge point was in need of replacement, and the internal upstream flap gate is in need of repair. Project to be developed to address this problem.

### **Overflow Point No. 007**

**Comment in Report:** Suggest reviewing tide gate operation.

**Action Status:** Field investigation revealed that the gate was in need of replacement. Gate was replaced.

### **Overflow Point No. 011**

**Comment in Report:** Suggest reviewing/correcting cause of regulator manhole surcharge and problem with river water entering submerged outfall.

**Action Status:** Staff unsure why manhole had surcharged. Daily inspections do not observe similar incidents. Tide gate for submerged outfall is normally closed as adjacent pump station (discharge point 012) is primary discharge point for overflows. Gate scheduled to be inspected and identified for yearly maintenance.

### **Overflow Point No. 013**

**Comment in Report:** Suggest review of sewer maintenance practices in regards to plugged sewer lines in area.

**Action Status:** WPCM staff is not aware of any unusual or above average maintenance issues in the area that need to be addressed. Intend to “flag” area to watch if overflow occurs again and determined to be due to plugged lines in area.

### **Overflow Point No. 016**

**Comment in Report:** Suggest looking into closing off CSO discharge point.

**Action Status:** CSO discharge piping has been bulk headed and not an active discharge point any more.

### **Overflow Point No. 020**

**Comment in Report:** Suggest reviewing/correcting operation of flap gate.

**Action Status:** Flap gate is at regulator, over 1500' from discharge point at river. The river does back up into the outfall, but does no significant harm unless regulator flap gate does not operate properly. Regular maintenance is performed on regulator.

**Overflow Point No. 023**

**Comment in Report:** Suggest reviewing/correcting operation of flap gate.

**Action Status:** Field investigation revealed nothing unusual. Flap gate normally submerged and closed. Sealing around gate to be inspected and any obstructions to be removed. Gate scheduled to be inspected and identified for yearly maintenance.

**Overflow Point No. 024 and 025**

**Comment in Report:** Suggest reviewing/correcting operation of flap gate.

**Action Status:** Flap gate normally submerged and closed. Sealing around gate to be inspected and any obstructions to be removed. Gates scheduled to be inspected and identified for yearly maintenance.

**Overflow Point No. 032**

**Comment in Report:** Suggest reviewing if river water an intrusion or condition of backflow prevention.

**Action Status:** Outfall normally submerged completely. River intrusion only reported to be problematic if river level very high. Site scheduled to be inspected to determine if any corrective actions are necessary.

**Overflow Point No. 050**

**Comment in Report:** Suggest reviewing/correcting operation of flap gate.

**Action Status:** Outfall normally submerged completely. Gate scheduled to be inspected and identified for maintenance as necessary.

# Nine Minimum Controls – No. 7

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## 7.0 POLLUTION PREVENTION PROGRAMS TO REDUCE CONTAMINANTS IN CSOs

### 7.1 OVERVIEW

The City uses an interdisciplinary and wide-ranging approach to address the seventh minimum control measure, pollution prevention. The City's Pollution Prevention Program focuses on nonstructural approaches to prevent or intercept solids, floatables and other contaminants before they enter the combined sewer system.

The idea behind this minimum control measure is that pollution should be prevented or reduced at the source whenever possible in order to reduce the contaminants entering the combined sewer system, and thus the receiving waters via CSOs. The pollution prevention program is applied to reducing the overall mass of solids and floatables that enters waterways, thereby reducing the aesthetic problems and nuisances associated with this particular kind of waste stream. Pollution prevention programs are also aimed at preventing or intercepting certain less visible but equally objectionable contaminants before they enter the overflow stream. A final benefit of pollution prevention, particularly floatable control, is that by controlling trash and debris before they enter the combined sewer system, the City reduces the risk that trash will interfere with a regulator or flap gate – possibly causing a dry weather overflow.

Although this strategy does not reduce or eliminate the solids and floatables associated with sanitary sewage, it is intended to control the discharge of the considerable amounts of debris carried into the combined sewer system during rain storms. Even citizens who may not understand many of the issues involved with combined sewer overflows may be aware of trash and debris along the City's riverbanks and in the rivers. While their concerns may be specifically related to appearance and aesthetics of the streams, it may be possible to amplify their interest and cause a behavioral change.

Because the techniques involved in the Pollution Prevention Program are not “end of pipe” solutions, this control strategy is not associated with particular outfalls. It is applied community wide, and not just in combined sewer area. However, it is possible that the level of effort can be adapted for particular drainage areas to ensure that outfalls that are typically problematic receive more intensive efforts to relieve the problem. For example, the the City Street Department cleans downtown streets more frequently than streets in residential areas. The downtown area is more likely to accumulate more trash and debris on the streets and the downtown area is served primarily by combined sewers. So a more intense focus downtown is likely to yield a greater pollution prevention benefit.

# Nine Minimum Controls – No. 7

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While much of the Pollution Prevention Program focuses on physical activities and efforts such as trash collection, recycling, street sweeping and inlet cleaning, a vital part of the program is public education and involvement. The goals of educating the public about and involving them in the pollution prevention effort are to cause behavioral change in both short term and long term. A one-day riverbank cleanup may result in an increased awareness of the effect of throwing a pop bottle out of a car window. This could result in a long-term increase in recycling and a reduction in littering overall.

As part of the implementation of this minimum control measure, City programs that have been going on as part of routine city services for decades are being refocused and outcomes tracked. Also, many components of this pollution prevention program are also required under the City's Stormwater NPDES Phase II program. The emphasis on pollution prevention as part of both the CSO and stormwater programs provides opportunities to educate City departmental and other agency employees about the importance of their efforts to the City's compliance with this control measure.

## 7.2 POLLUTION PREVENTION ACTIVITIES

The City, through various departments, conducts a variety of routine and specialized pollution prevention activities:

- Street sweeping
- Leaf collection
- Trash collection and curbside recycling
- Yard waste pickup
- Great American Clean-Up/Riverbank cleanup
- Adopt-A-Greenway
- Trash collection in parks
- Neighborhood cleanup days
- Tire collection
- Household Hazardous Waste collection
- Hazardous spill response
- Inlet and Catch basin cleaning
- Industrial pre-treatment
- Dead animal pickup

Each of these programs, including scope, goals, expected benefits and measures, is detailed in Exhibit G-1. The City's curbside recycling program began in 1995. The Great American Clean-Up/Riverbank cleanup, Yard waste pickup and Neighborhood Cleanup days have been ongoing for at least the last 15 years. The Adopt-A-Greenway program began during the 1990s. All other of the above activities have been ongoing for the 20 years (more precise implementation dates

# Nine Minimum Controls – No. 7

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are not available). A Pet Waste Management Program is also under development and consideration.

## 7.3 PUBLIC EDUCATION AND PARTICIPATION

In addition to actually carrying out the programs listed above and described in the exhibits to this chapter, the City invests in an aggressive public education and outreach program to make citizens aware of the Pollution Prevention Program efforts and to encourage their involvement. The City employs a Public Information Officer and contributes funding, support and program guidance for an education specialist employed by the Allen County Partnership for Water Quality. The City also works closely with the Allen County Solid Waste District on the development and cross-promotion of pollution prevention and waste reduction programs.

The reason that the City invests so heavily in public education is because we believe that public awareness of water resource issues may result in public involvement in efforts to reduce the amount of solids, floatables and other pollutants entering the combined sewer system and thereby, the receiving waterways. Reducing litter in streets, properly disposing of leaves and household hazardous material, and paying attention to the kind of material being disposed of in toilets and storm sewer inlets, especially those in the combined sewer area, are all vital to the Pollution Prevention Program

The City's website ([www.cityoffortwayne.org](http://www.cityoffortwayne.org)) includes information about the City-sponsored pollution prevention activities detailed in Exhibit G-1 of this chapter. The website also provides information about pollution prevention activities that may be conducted by other agencies or area businesses. While tire recycling events and hazardous waste disposal events sponsored by public agencies are held only sporadically during the year, the City's website give the names and locations of local businesses that recycle tires, oil, hazardous and other material. Most of these businesses charge a fee for accepting and handling these items. The Allen County Solid Waste District also publishes an annual Waste-Watcher newspaper insert and pays for television and radio advertising to promote the appropriate disposal of solid and hazardous waste.

The Partnership for Water Quality provides educational opportunities and materials to help citizens learn more about watersheds and water resource issues generally. The Partnership for Water Quality has created a variety of materials that are made available at the Partnership Office and through the City. The Partnership also hosts a booth at several annual community events such as the Three Rivers Festival, the Allen County Fair and Black Expo where educational materials are distributed. A list of available educational materials and samples may be found in Exhibit G-2.

## **Nine Minimum Controls – No. 7**

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In addition to providing information about programs, the City uses a variety of tools to educate citizens about the nature of the combined sewer system itself -- how it operates, why it exists and the efforts underway to better control overflows. The City's CSO Public Notification Program (see Chapter 8) is intended primarily to inform the public of the possible health and environmental effects of combined sewer overflows, to make them aware of when CSOs are occurring or are likely to occur, and to educate them about the City's efforts to manage CSO discharges in accordance with federal mandates. Although public notification does not reduce the frequency of CSO discharges or pollutant loads, such notice can reduce the potential risk of adverse health effects. CSO outfall locations are marked with signage including the telephone number for a Water Quality Hotline that provides information about the nature of CSO and whether overflows are occurring. While many of these efforts have been intended to meet federal program requirements, they are also intended to gain public confidence and demonstrate the City's sincere commitment to environmental stewardship.

The City has been actively committed to involving the public in making decisions about how pollution reduction in local waterways will be accomplished and providing updates on the status of established CSO control programs. A voluntary citizen-based Sewer Advisory Group meets bi-monthly to receive updates on the City's sewer operation and maintenance activities, progress in carrying out combined sewer capacity improvement projects and to give input on program priorities. The Sewer Advisory Group has been actively helping the City make decisions about its sewer utility operations since 1995.

### **7.4 PROGRAM EVALUATION**

The goal of the Pollution Prevention Program is to use a combination of pollution prevention, reduction and management tools that will reduce the amount of pollution entering the combined sewer system. For each activity in the Pollution Prevention Program the City has established goals and methods for evaluating outcomes on an annual basis. Another goal is to expand the public's knowledge of the combined sewer system and its impact on rivers and streams and to increase public involvement in activities that may improve river quality.

The degree to which pollution prevention can reduce contamination of receiving water bodies through CSOs is unknown. In theory, the cost for each unit of pollution reduced through prevention should be lower than the cost to collect and physically treat the same unit at the CSO outfall. In some circumstances, however, source control measures sufficient to provide effective pollution control over a diffuse area could be more costly than control measures at CSO outfalls.

## **Nine Minimum Controls – No. 7**

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The effectiveness of pollution prevention efforts is sometimes difficult to ascertain. Water quality sampling is only one measure of an effective pollution prevention program. Another water quality based measure is how citizens feel about the cleanliness of the environment including rivers and streams. Effectiveness can also be measured in terms of the number of people involved in activities that may have a pollution prevention outcome – tons of material recycled, number of volunteers participating in the Great American Clean-Up or the number of people who drop-off material during the annual Household Hazardous Waste collection day.

Even in cases where pollution prevention measures provide limited tangible benefits, they may have two important ancillary benefits. Reductions in the quantity of pollutants entering the combined sewer system will reduce the City's operation and maintenance on any overflow control that may be implemented as part of a CSO control program. In addition, public participation in pollution prevention activities will serve to heighten awareness of CSO issues and may increase public support for the overall program.

### **7.5 RECORD KEEPING**

The Pollution Prevention Program relies on the on-going activities of a variety of City Departments and some outside agencies. Each department or agency is aware of their role in the Pollution Prevention Program and the requirement that they track certain data to be compiled on an annual basis.

The City's Planning and Design Services Department is responsible for collecting relevant data from each department or organization annually. He or she will annually summarize information related to each pollution prevention activity which will be kept at Exhibit G-3. A sample format for the summary may be found at Exhibit G-3.

# Nine Minimum Controls – No. 7

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## DIRECTORY FOR APPENDIX G (Items Presented in Order of Appearance in Appendix G)

<u>Item</u>	<u>Description</u>
Exhibit G-1	POLLUTION PREVENTION ACTIVITIES - DETAILS
Exhibit G-2	LIST OF AVAILABLE EDUCATIONAL MATERIALS AND SAMPLES
Exhibit G-3	ANNUAL REPORT OF POLLUTION PREVENTION ACTIVITIES

## **Nine Minimum Controls – No. 7**

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### **EXHIBIT G-1**

# Polution Prevention Activities - Details

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**Program Name:** STREET SWEEPING

**Responsible Party:** Fort Wayne Street Department under the direction of the Street Commissioner

**Description of Activity, Scope and Expected Benefits:**

Street sweeping reduces the amount of debris entering the combined and storm sewers by collecting it before it has the opportunity to wash into a catch basin or inlet. This control is highly applicable to developed and established urban areas with curbed streets and stormwater collection facilities. In addition to collecting trash and debris – potential floatables – street sweeping reduces grit and heavy metals that can easily be transported to receiving streams through overflows.

The goal of the street sweeping program in Fort Wayne is to sweep each City street at least four times per year. Fort Wayne uses vacuum sweepers that have higher efficiency than mechanical sweepers. The City is divided into five street sweeping areas. During daytime hours, one street sweeper is assigned to each of four quadrants. Each quadrant has a predetermined route and streets are swept according to that route. One street sweeper and operator is assigned to the third shift. Overnight when traffic and parking are reduced, this sweeper cleans streets in the downtown area Sunday thru Thursday night. Arterials are swept as time permits and as sweepers are traveling to residential areas. Sweepers also respond as needed to clean up glass and debris on arterials. Currently concrete and asphalt alleys are not swept as part of regular street sweeping routes but are swept on a request basis. Streets are swept spring, summer and fall. City Street Dept sweeps approx 16,000 curb miles per year spending 1,200 staff hours.

During the summer months – April through September – a two-person team (Clean Team) uses a sidewalk sweeper to clean alleys, sidewalks and streets of solid and floatable material and to beautify the downtown area.

**Goals:**

- Sweep each City street at least four times per year
- Sweep 16,000 curb miles per year
- Respond as requested to clean up glass and debris on arterials
- Sweep concrete and asphalt alleys as requested

**Measures:**

- Number of times each street is swept
- Number of curb miles swept each year
- Tonnage of material collected by the sweepers
- Debris collected by the Clean Team:  
(This is counted in terms of number of 33-gallon trash bags filled)

# Polution Prevention Activities - Details

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**Program Name:** LEAF COLLECTION

**Responsible Party:** Fort Wayne Street Department under the direction of the Street Commissioner

**Description of Activity, Scope and Expected Benefits:**

The City's Street Department operates a neighborhood leaf collection program annually from mid-October through mid-December. The City is divided into three areas, north, central and south, and leaf collection crews spend three weeks in each area on a rotating basis. The program is intended to remove the majority of leaves from residential neighborhoods in a timely manner so that they will not accumulate over catch basins and inlets. Clogged inlets are a major contributor to street flooding. Leaf removal is important to keep leaves and leaf debris from entering the combined sewer system and possibly interfering with regulator or flap gate operation. From a public safety perspective, dry leaves on an unimproved street may contribute to fires if cars are parking over piles of leaves, and wet leaves can make it difficult for cars to brake effectively.

Much of the effectiveness of the program depends on public involvement. Residents receive utility bill stuffers notifying them of the dates when leaf crews will be in their area of the City. Residents are asked to rake their leaves to the curb but not into the street during the week when leaf collection crews will be in their area of the City. Leaves may also be placed in biodegradable yard waste bags and placed at the curb. Street Dept crews use front-end loaders to collect the leaves, placing them in dump trucks for transport to the city's yard waste recycling facility. In some areas, particularly areas with unimproved streets, leaf vacuums are used to collect leaves. A street sweeper also follows each leaf collection crew.

The effectiveness of leaf collection as a pollution prevention activity is somewhat difficult to measure. Measuring tons of leaves doesn't quite suit since tonnage depends on the fullness of trees. Tonnage also depends on whether the leaves collected are wet or dry and on whether the snow removal interferes with completion of leaf collection.

**Goals:**

Complete leaf collection

**Measures:**

Leaf collection completed

# Polution Prevention Activities - Details

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**Program Name:** TRASH COLLECTION AND CURBSIDE RECYCLING

**Responsible party:** Fort Wayne's Solid Waste Department through its trash collection contractor National Serv-All

**Description of activity, scope and expected benefits:**

The City of Fort Wayne employs a private firm to collect trash/garbage on a weekly basis. The same company provides curbside recycling on the same day as trash collection but on a bi-weekly basis. Each household is provided with two 18-gallon recycling bins – one for newspapers, magazines, catalogues, cardboard, fiberboard and phonebooks – the other for glass, plastic and metal recyclables.

The City's contractor also collects bulky items including heavy furniture and non-Freon appliances if they are placed with the trash/garbage either at the curb or in the alley. Items that cannot be placed for collection by the contractor include tires, hazardous waste, large amounts of construction and demolition debris (over 60 pounds per week) and Freon appliances.

The effectiveness of trash collection and recycling programs is dependent upon the level of public participation. For citizens to participate the programs must be clearly communicated, convenient and low cost. Fort Wayne's Solid Waste Department provides on-going education for the community concerning trash collection and recycling. The City's website ([www.cityoffortwayne.org](http://www.cityoffortwayne.org)) includes an extensive section that details material that can be recycled as well as information about proper disposal of unusual items such as Freon appliances, asphalt, batteries, computer equipment, fluorescent bulbs, hazardous waste, paint and tires that cannot be recycled or collected by the city's trash hauler. The City encourages private collection companies to keep charges for collecting these materials as reasonable as possible to discourage illegal dumping

In addition to website, other public information/education programs include:

- Annual utility bill stuffers outlining what can be recycled;
- Mailers to newly annexed residents about trash collection and recycling;
- Cooperative efforts with the Allen County Solid Waste District to distribute information about what can be recycled and options for disposal of material that cannot be recycled or placed in the trash;
- Presentations to schools regarding recycling;
- Information at community events such as the Home and garden Show;
- Magnets mailed to homes designating them as either week "A" or week "B" recyclers along with phone numbers to call for more information.

Convenient programs for trash disposal and recycling can result in less trash and debris being dumped in remote areas or along streambanks. Another expected benefit of an effective trash and recycling program is an increase in the tonnage of recycled material collected and a reduction in street trash and litter that can eventually make its way into the combined sewer system. Beginning in 2006, every homeowner will receive a garbage cart to be used to hold trash and garbage when it is placed out for collection. Use of the carts should eliminate the possibility of bags breaking on the street or being torn open and spilling. This should further reduce the amount of trash on City streets.

# Polution Prevention Activities - Details

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**Goals:**

Create a convenient and well-understood trash and recycling collection program

**Measures:**

Tons of material recycled per year

Number of educational programs presented

# Polution Prevention Activities - Details

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**Program Name:** YARD WASTE RECYCLING

**Responsible party:** City of Fort Wayne through its trash collection contractor National Serv-All and at the Biosolids Handling Facility

**Description of activity, scope and expected benefits:**

Yard waste, except leaves, can be placed with the garbage for collection all year long by the City's trash collection contractor. Grass clippings may be bagged in plastic bags or placed in refuse containers. Biodegradable yard bags may also be used. Branches will be collected and there is no limit on the amount so long as they are prepared appropriately

One City operated site and one private site are also available for yard waste disposal. The City operated a yard waste recycling facility accepts leaves, garden waste, purnings, vines, grass clippings and brush. There is a small charge for disposal at both sites. Construction debris, wood fencing, tires and garbage are NOT accepted at either site.

The City's site also makes mulch, recycled lime sludge and recycled sewage biosolids available for pickup by citizens.

The Fort Wayne Solid Waste Department and Allen County District work to encourage property owners to mulch grass clippings rather than put them out for collection.

**Goals:**

Increase public awareness of options for recycling yard waste  
Increase tonnage of yard waste collected at drop-off sites

**Measures:**

Tons of yard waste collected at recycling sites

# Polution Prevention Activities - Details

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**Program Name:** GREAT AMERICAN CLEAN-UP/RIVERBANK CLEANUP

**Responsible party:** Fort Wayne's Solid Waste Department

**Description of activity, scope and expected benefits:**

The Great American Cleanup in Fort Wayne is a one-day per year event that is focused on cleaning up the community. Fort Wayne's Solid Waste Management Department recruits and organizes several thousand volunteers, matching volunteer groups specific clean up projects or areas. Activities include neighborhood trash and debris removal, used tire collections, and riverbank cleanups. Items collected include furniture, appliances, plastic bottles, tires, Styrofoam and other trash. The event also includes a litter prevention education program and is organized in conjunction with Keep America Beautiful, Inc. The City also recruits sponsors for the event whose contributions help to pay for gloves, trash bags and flower seeds that are provided to the volunteers. Tee shirts are also provided to volunteers so they have an on-going reminder of the project they carried out and an incentive to carry on litter prevention activities throughout the year.

Riverbank cleanup activities and the removal of litter and debris from neighborhoods and streets reduces the amount of these materials that are likely to make their way into the combined sewer system and thus into Fort Wayne's rivers. The litter prevention education that goes on as part of the Great American Cleanup program can help to increase awareness of the problems caused by litter.

**Goals:**

Recruit volunteers to carry out cleanup projects identified by the Solid Waste Department  
Educate volunteers on the importance of reducing litter throughout the year  
Reduce trash and debris on streets, in neighborhoods and along riverbanks

**Measures:**

Number of volunteers  
Number of sites/projects  
Tons of trash/debris collected

# Polution Prevention Activities - Details

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**Program Name:** ADOPT-A-GREENWAY

**Responsible party:** Fort Wayne Department of Parks and Recreation

**Description of activity, scope and expected benefits:**

The Fort Wayne Department of Parks and Recreation manages the Rivergreenway Trail, a 15.5 mile long linear park along the banks of the St. Mary's, St. Joseph and Maumee Rivers in Fort Wayne. In addition to providing a limited access park that is ideal for walking, running, rollerblading and bicycling, the Rivergreenway offers natural vistas and scenic overlooks within an urban environment. The greenway also creates a natural area to accommodate overflow from the rivers during periods of high water and flooding.

The Adopt-A-Greenway program to help keep Fort Wayne's Rivergreenway Trail maintained. Organizations agree to adopt a two-mile section of the Greenway and to clean their section of the trail three times a year. In exchange for a group's assistance, a sign is placed along their section recognizing the group. The program helps to keep trash and debris from entering the adjacent rivers. In addition, the Fort Wayne Parks and Recreation Department website provides a way for greenway users to notify the Parks Department of problems along the greenway that may be in need of clean up or repair.

**Goals:**

Increase awareness of the benefits of the Rivergreenway

Increase the number of organizations participating in the Adopt-A-Greenway Program

**Measures:**

Number of participating organizations

Number of cleanups per year

Number of volunteers

# Polution Prevention Activities - Details

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**Program Name:** TRASH COLLECTION IN PARKS

**Responsible party:** Fort Wayne Department of Parks and Recreation

**Description of activity, scope and expected benefits:**

The Fort Wayne Department of Parks and Recreation collects trash and empties trash cans and dumpsters in all 84 of Fort Wayne's parks at least daily. The department owns and uses its own trash collection truck to perform collections.

While the primary goal of the Parks trash collection program is to project an image that the parks are clean and safe places for children to play, pollution prevention is an ancillary benefit. The majority of Fort Wayne's parks are located adjacent to one of the City's three rivers or they contain open drains or small streams. Regular trash collection helps to keep trash and other contaminants from directly entering waterways and also reduces the amount of debris that may enter the combined sewer system from the parks that are located in the combined sewer area.

**Goals:**

Empty trash cans in parks every weekday

**Measures:**

Trash cans in parks are emptied every weekday

# Polution Prevention Activities - Details

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**Program Name:** NEIGHBORHOOD CLEANUP DAYS

**Responsible party:** Fort Wayne Division of Community Development and Fort Wayne Solid Waste Department

**Description of activity, scope and expected benefits:**

The Division of Community Development uses funds from the Community Development Block Grant program to help fund neighborhood cleanups from April through October of each year. The program aims to help clean up poorly maintained, vacant lots, alleys and individual properties. Neighborhoods must meet certain income eligibility guidelines in order to qualify for the program, and the majority of the income eligible neighborhoods are located within the City's combined sewer system area.

Community Development offers each eligible neighborhood an opportunity to schedule two clean up days per year. The City provides roll-off dumpsters and removal. Items that may be collected and disposed of include trash, construction debris and yard waste. This program helps to remove trash and other debris that might otherwise find its way into the combined sewer system and into waterways as pollution. By providing a convenient way to dispose of construction debris, this program makes it less likely that such material will find its way into a catch basin, possible interfering with a flap gate or regulator and causing a dry weather overflow. Keeping construction debris out of sewer lines also helps to maintain the capacity of the sewer system.

The Solid Waste Department offers a similar program in neighborhoods that do not meet the CDBG eligibility guidelines.

**Goals:**

Organize as many cleanup days in neighborhoods and funding and resources allow

**Measures:**

Number of neighborhoods participating

Number of clean-up days held per year

Tons of material collected

# Polution Prevention Activities - Details

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**Program Name:** WASTE TIRE DISPOSAL

**Responsible party:** Allen County Solid Waste District, Fort Wayne Community Development Division

**Description of activity, scope and expected benefits:**

Very few products are considered to be worn out when they are only 5% used – except tires. Used tires are a constant solid waste problem. Because there is often a cost to dispose of or recycle tires, they often find their way into rivers and streams. Along river and stream banks, dumped tires become breeding grounds for many pests including mosquitoes, which may carry diseases that are harmful to humans.

Within the Fort Wayne area, two programs offer alternatives to dumping or stockpiling waste tires. Each year the Allen County Solid waste District sponsors a Tire Amnesty Day on one Saturday in October when residents may drop off tires at a designated location for recycling. A minimal fee is applied.

As a way to encourage neighborhood associations to remove tires that may accumulate in residential areas, the City's Division of Community Development conducts a tire disposal program. Neighborhoods that register may bring tries to a drop-off location. The tires will be hauled away and disposed of by the City. The City pays the neighborhood association a small amount per tire. This program is intended to provide a cash incentive for neighborhood clean up and to make tire disposal more convenient for organized groups.

Many tire dealers will dispose of old tires for a small fee.

**Goals:**

Provide convenient tire disposal options to discourage dumping

**Measures:**

Number of tires collected through established collection programs

# Polution Prevention Activities - Details

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**Program Name:** HOUSEHOLD HAZARDOUS WASTE COLLECTION  
(TOX-AWAY DAY)

**Responsible party:** Allen County Solid Waste Department

**Description of activity, scope and expected benefits:**

Illegal disposal of household hazardous wastes can introduce waste oil and a multitude of toxic materials to the combined sewer system – whether these materials are dumped down a sink, floor drain or toilet or poured into a catch basin.

In order to reduce the likelihood that these materials will enter the combined sewer system, the Allen County Solid Waste District gives residents an opportunity to safely dispose of various hazardous and toxic household products. “Tox-Away Day” is held annually in a designated location. Allen County residents may drop off a limited amount of material at no charge. The event is well publicized via television, radio and newspaper advertising. Because it is typically held around the same time each year and because this has been an on-going program for more than 15 years, area residents look forward to the event and store material for drop off.

The City of Fort Wayne participates in the event by helping to publicize it through utility bill stuffers, notices of the government access television station and on the City’s website. The City’s website also provides information on companies that participate in various hazardous waste collection programs throughout the year.

**Goals:**

Increase awareness of Tox-Away Day  
Increase number of participants  
Increase amount of material collected

**Measures:**

Number of participants  
Weight of various material collected

# Polution Prevention Activities - Details

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**Program Name:** HAZARDOUS SPILL RESPONSE TEAM

**Responsible party:** Fort Wayne Fire Department, Allen County Emergency Management Department, Allen County Solid Waste district

**Description of activity, scope and expected benefits:**

The Fort Wayne Fire Department's Hazardous Materials Team is made up of 36 members trained to the requirements of the National Fire Prevention Act, Technician level. The team responds to spills and incidents involving hazardous materials within the City of Fort Wayne and throughout Allen County and has mutual aid agreements with several surrounding communities.

The technicians are trained to entry into various hazardous environments and are capable of performing a variety of tasks. Assignments may include: recognizing and identifying hazardous materials, monitoring hazardous atmospheres, containment or confinement of a hazardous material spill or leak, use of absorbing material, pressurized container leaks, highway transportation and railroad tank car accidents. The Allen County Emergency Management Department keeps records of all hazardous material incidents in the County.

The Allen County Solid Waste District has staff trained to assist with managing mercury spills and has monitoring equipment that can be used in mercury detection.

Many hazardous material incidents – particularly those with the potential for an especially large amount of material to enter a waterway – involve traffic accidents. If these accidents happen in a combined sewer area, the possible risk of entry into the combined sewer system is great, particularly if rainy conditions have contributed to the accident. Incidents involving smaller spills of highly hazardous material (for example mercury) may occur in less public places such as dentists' offices or school laboratories. Many times, those ignorant of appropriate containment and clean up procedures flush the hazardous material directly into the combined sewer system by washing the material down a drain or pumping it into a toilet.

Having a trained Hazardous Spill Response Team and other trained agencies in Fort Wayne provides for quick response to incidents that could potentially lead to widespread hazardous contamination of the community's rivers. Increasing awareness through public education programs will ensure that people in the community know there are resources available to assist with hazardous material spills. In this way, we hope to reduce the number of spills that are simply washed down the drain.

**Goals:**

Increase awareness of how to respond to a hazardous material emergency  
Increase consumer knowledge of what constitutes a hazardous material

**Measures:**

Number of Hazardous Material responses  
Reduce number of incidents where hazardous material is found in a sewer or water body.

# Polution Prevention Activities - Details

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**Program Name:** CATCH BASIN CLEANING

**Responsible party:** Water Pollution Control Maintenance/Stormwater Maintenance

**Description of activity, scope and expected benefits:**

Frequent removal of accumulated catch basin deposits is a method often proposed in CSO control programs to reduce the heavy “first flush” effect of deposited solids that is transported by stormwater flow through the combined sewer system. A regular cleaning program also helps reduce the buildup of sediment in the catch basins and increases the likelihood that debris can be removed from the system before it can contribute to a dry weather overflow. Although not a pollution prevention or regulatory outcome, cleaner catch basins mean that water is more likely to drain from the streets more quickly, thereby reducing the number of street flooding calls to the City during wet weather events.

Fort Wayne’s Water Pollution Control Maintenance Department assigns two vactor trucks to the program of regular, scheduled catch basin cleaning. One vactor is assigned to the northern half of the City and one to the south half. The goal of the program is to clean every catch basin and inlet every 2.5 years or approximately 31 structures per day. The material removed from catch basins and inlets is weighed daily. The same vactor trucks and crews also respond to a variety of other needs, so vactor trucks may be called off the cleaning routes as needed for other work.

Catch basins are also cleaned in response to complaints of street flooding and odor.

**Goals:**

Clean each of the City’s 15,500 known structures every 2.5 years

**Measures:**

Frequency of cleaning  
Tons of material removed

# Polution Prevention Activities - Details

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**Program Name:** INDUSTRIAL PRE-TREATMENT

**Responsible party:** Industrial Pretreatment Section, Water Pollution Control Plant

**Description of activity, scope and expected benefits:**

The Industrial Pretreatment Section of the Fort Wayne Water Pollution Control Plant is responsible for the oversight of significant industrial users, contract customers and non-major dischargers. Each of these dischargers is monitored at strategic sampling points four times each year to ensure that dischargers are complying with concentration limits placed on a variety of toxic ions, compounds and other substances entering the combined sewer system. In addition to monitoring discharges as outlined in industrial pre-treatment permits, the IPS also ensures that dischargers comply with limitations determined by their Standard Industrial Classification (SIC) code.

The IPS also reviews development plans to determine if new users of the sewer system should be required to install control manholes or sand, oil or grease traps. Based on monitoring results or complaints, the IPS employees will work with individual industries or businesses to find ways to reduce their discharge concentrations to within acceptable limits. The IPS staff members also perform facility audits on each of the discharging Significant Industrial Users within the City of Fort Wayne and outlying areas served by the Fort Wayne Water Pollution Control Plant.

As part of the effort to reduce the amount of grease collecting within sewer pipes that may reduce pipe capacity, the industrial pre-treatment program conducts a restaurant monitoring program involving compliance checks for oil and grease at restaurants that discharge into established sewer line degreasing zones.

An effective industrial pretreatment program will help to ensure that effluent from the Water Pollution Control Plant meets or is better than the limits set in the City's NPDES permit. The program helps to limit heavy metal concentrations in sewage treatment residuals (biosolids) and helps to protect the quality of the City's three rivers by monitoring and reducing the amount of pollution that may enter the rivers through the combined sewer system.

**Goals:**

Increase sampling and inspection at restaurants in areas requiring the most sewer degreasing  
Review all building permit applications for compliance with separator and control manhole requirements

Collect and test samples from industrial and wholesale sewer customers

Conduct SIU compliance, inspection and monitoring programs

**Measures:**

Rate of non-compliance for categorical SIUs and non-categorical SIUs

Number of facility audits performed

Number of samples collected (at least four per year for each industrial and wholesale customer)

Number of restaurant compliance checks

Number of building permits reviewed

# Polution Prevention Activities - Details

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**Program Name:** DEAD ANIMAL PICKUP

**Responsible party:** Fort Wayne Street Department

**Description of activity, scope and expected benefits:**

In an urban area, it is inevitable that vehicular traffic will occasionally cause the death of wild animals or pets that venture into the street. Fort Wayne provides two options for the removal and disposal of dead animals. The Fort Wayne Street Department provides collection of dead animals as they are found by Street Department crews who are doing other work or when reported by citizens. Dead animals may also be disposed of at the shelter operated by the City's Department of Animal Care and Control.

By providing a program to remove animal carcasses, the City reduces the likelihood that dead animals will be disposed or washed into catch basins, and possibly into the combined sewer system. This not only reduces the pathogens that may enter the system from dead animals, but also reduces the possibility that this kind of debris will cause a regulator or flap gate malfunction.

**Goals:**

Respond to complaints of dead animals by removing them within 24-hours.

**Measures:**

Number of calls receiving responses

Number of animals collected

# Polution Prevention Activities - Details

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**Program Name:** PET WASTE MANAGEMENT

**Responsible party:** Partnership for Water Quality

**Description of activity, scope and expected benefits:**

Fort Wayne City Code contains provisions requiring persons responsible for animals to immediately remove animal excrement from public lands or the property of others. City Code pertaining to the use of City Parks requires that pet owners carry with them proper paraphernalia for removing pet waste from parkland.

Pet feces and litter can introduce organic contamination, nutrients and bacteria into the combined sewer system when these wastes are washed off yards or parklands.

By educating citizens about the contamination that may be caused by pet waste, and by providing information about the legal requirements to clean up after pets, the City may be able to reduce the amount of bacteria and nutrients that enter the rivers through the combined sewer system.

**Goals:**

Implement a public education program on pet waste

**Measures:**

Public education material created and distributed

## **Nine Minimum Controls – No. 7**

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### **EXHIBIT G-2**

# List of Available Educational Materials and Samples

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## Flyers

Available from Partnership for Water Quality  
3718 New Vision Drive, Fort Wayne  
and on the Partnership Website at [www.acwater.org](http://www.acwater.org)

Combined Sewer Overflow – A Reference Guide for Homeowners  
Green Landscaping  
Household Hazardous Waste  
Stormwater Pollution  
Drinking Water in Your Community  
West Nile Virus  
Stormwater Activity Book

Available from City of Fort Wayne  
One East Main Street, Room 200  
Fort Wayne, Indiana

Combined Sewer Overflows  
Dealing With Flood and Sewer Waters  
Step-by-Step Downspout Disconnection Guide  
Biosolids Use and Reuse

Available from the Allen County Solid Waste District  
449-7878  
[www.acwastewatcher.org](http://www.acwastewatcher.org)

Waste Watcher Recycling Guide

## **Nine Minimum Controls – No. 7**

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### **EXHIBIT G-3**

# Annual Report of Pollution Prevention Activities

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## Fort Wayne Pollution Prevention Program Annual Report for 200\_\_

Pollution Prevention is an on-going program of the Fort Wayne Combined Sewer System Operational Plan. It focuses on nonstructural approaches to prevent or intercept solids, floatables and other contaminants before they enter the combined sewer system.

During the year 200\_\_\_\_, the following activities were carried out with the following accomplishments:

### Street Sweeping

Changes planned for 200\_\_

- Conduct a community survey to find out how effective trash collection and street sweeping programs are based on overall “clean” score

Performance Measure(s)

- Times each street is swept 5 times \_\_\_\_\_%; 4 times \_\_\_\_\_%; 3times \_\_\_\_\_%
- Number of curb miles swept
- Tons of material collected
- Bags collected by Clean Team

### Leaf Collection

Changes planned for 200\_\_

Performance Measure(s)

- Percentage of collection completed on time

### Trash Collection & Curbside Recycling

Changes planned for 200\_\_

Performance Measure(s)

- Tons of material recycled
- Number of educational programs presented

### Yard Waste Recycling

Changes planned for 200\_\_

Performance Measure(s)

- Tons of yard waste collected

### Great American Cleanup/Riverbank Cleanup

Changes planned for 200\_\_

- Implement a community riverbank cleanup in the fall

Performance Measure(s)

- Number of volunteers
- Number of sites/projects
- Tons of trash/debris collected

# Annual Report of Pollution Prevention Activities

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## **Adopt-A-Greenway**

Changes planned for 200\_\_

Performance Measure(s)

- Number of participating organizations
- Number of cleanups per year
- Number of volunteers

## **Trash Collection in Parks**

Changes planned for 200\_\_

Performance Measure(s)

- Trash cans in parks emptied every weekday

## **Neighborhood Cleanup Days**

Changes planned for 200\_\_

Performance Measure(s)

- Number of neighborhoods participating
- Number of clean-up days held
- Tons of material collected

## **Waste Tire Disposal**

Changes planned for 200\_\_

Performance Measure(s)

- Number of tires collected

## **HHW Collection – Tox-Away Day**

Changes planned for 200\_\_

Performance Measure(s)

- Number of participants
- Weight of material collected

## **Hazardous Spill Response Team**

Changes planned for 200\_\_

Performance Measure(s)

- Number of times hazardous material is found in sewer or waterbody
- Number of Haz Mat responses

## **Catch Basin Cleaning**

Changes planned for 200\_\_

Performance Measure(s)

- Frequency of cleaning
- Tons of material removed

## **Industrial Pre-Treatment**

Changes planned for 200\_\_

Performance Measure(s)

# Annual Report of Pollution Prevention Activities

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- Rate of non-compliance for categorical SIUs
- Rate of non-compliance for non-categorical SIUs
- Number of samples collected
- Number of restaurant compliance checks
- Number of building permits reviewed

## **Dead Animal Pickup**

**Changes planned for 200\_\_**

**Performance Measure(s)**

- Number of called responded to
- Number of animals collected

## **Pet Waste Management**

**Changes planned for 200\_\_**

- Increase public education on pet waste disposal – develop a brochure and distribute through veterinarians' offices

**Performance Measure(s)**

- Public education material created and distributed

## **Public Education**

**Changes planned for 200\_\_**

Complete community education plan for Mercury and implement

- Employee training
- Bill stuffers
- Web page
- Community presentations (4)

**Performance Measure(s)**

- Public information material created
- Public information material distributed
- Public presentations given

# Nine Minimum Controls – No. 8

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## 8.0 PUBLIC NOTIFICATION

The 8<sup>th</sup> NMC is intended to ensure that the public is informed of CSOs and CSO activities.

### 8.1 OVERVIEW

The City's Public Notification Program is intended primarily to inform the public of the possible health and environmental effects of combined sewer overflows, to make them aware of when CSOs are occurring or are likely to occur, and to educate them about the City's efforts to manage CSO discharges in accordance with federal mandates. Public notification is the eighth minimum control and the strategies for complying with public notification requirements vary according to local circumstances. The City has sought to implement public notification strategies that are cost effective but also provide reasonable assurance that affected members of the public are informed accurately and in a timely manner. Although public notification does not reduce the frequency of CSO discharges or pollutant loads, such notice can reduce the potential risk of adverse health effects.

The City has also been actively committed to involving the public in making decisions about how pollution reduction in local waterways will be accomplished and providing updates on the status of established CSO control programs. In addition, the City has been concerned about addressing the water quality issues that are important to the public and has sought input to identify those issues. The City regularly educates the public on various aspects of the collection system through established channels and programs and educates the public regarding what goes into the nation's waters through CSOs. While all of these efforts have been intended to meet federal program requirements, they are also intended to gain public confidence and demonstrate the City's sincere commitment to environmental stewardship.

The City provides a variety of information sources for the public to learn about CSO. The information sources and educational activities will be discussed in this chapter along with the CSO Public Notification Procedure. Samples of educational materials are included in Exhibit H-1 and a copy of the current CSO Public Notification Procedure is included in Exhibit H-2. Annual reports will contain the analysis of specific CSO notifications issued by the City along with information about any changes in the CSO Notification Program. A sample format for the annual report is included in Exhibit H-3. Annual reports will be available for public review on the City's website at [www.cityoffortwayne.org](http://www.cityoffortwayne.org).

### 8.2 EDUCATIONAL ACTIVITIES

## Nine Minimum Controls – No. 8

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The Allen County Partnership for Water Quality (ACPWQ) was created in July 2002 by the City and other local governmental entities to help educate the public and the media about water resource issues. The Partnership hired a Water Resource Education Specialist to be a liaison with the local news media and the public to educate them on watershed based issues, activities and services. The ACPWQ focuses its work on education and outreach efforts related to combined sewer overflows as well as stormwater pollution, conservation efforts, drinking water protection and other water resource issues.

The Partnership provides public education opportunities through: presentations at neighborhood association meetings; classroom demonstrations and workshops; displays and information at local events such as the Three Rivers Festival and Earth Day Celebration, the Fort Wayne Farm Show and Allen County 4-H Fair. The Partnership has sought and used grant funding to distribute a documentary on water quality and associated material to teachers and has created a stormwater activity book for grades K through 3. A list of the educational materials produced by the Partnership for Water Quality and the City may be found in the Exhibit H-4. Samples of these educational materials may be found in Exhibit H-1.

Besides the activities of the Partnership, the City works to engage the public in a regular dialogue on water quality issues through the Sewer Advisory Group. Originally organized as the “Sewer Task Force” to develop recommendations on how the City should proceed to reduce the likelihood of sewer backups into basements, the forum continues to encourage citizens to participate with the City in the selection of priorities and alternatives to address many sewer related issues. In addition to educational and agenda setting functions, the SAG also keeps the City accountable for commitments made and may help generate support for rate increases needed to carry out those commitments.

The City operates and maintains a website ([www.cityoffortwayne.org](http://www.cityoffortwayne.org)) where educational information about CSOs and water quality is posted. The website also includes information about the CSO Notification Procedure and how citizens may request notice (discussed below).

A list of contacts for educational activities may be found in Exhibit H-5.

### 8.3 INFORMATION SOURCES

In developing sources of information about the location of CSO outfalls, actual occurrences of CSOs and the possible health and environmental effects, the City desired to conduct a cost effective program that would also provide accurate and timely information to potentially affected populations.

# **Nine Minimum Controls – No. 8**

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## **8.3.1 CSO Signs**

Notice signs have been installed at each CSO outfall location and in many areas where the City's rivers and CSO affected streams are easily accessible. An example of a CSO notices sign may found in Exhibit H-6. Additional signs are being installed in neighborhoods as they are requested by neighborhood associations. Signs are checked during outfall and regulator inspections so that they can be repaired or replaced as necessary from an existing stock of signs. Records are kept of the sign locations, dates when the signs were posted, and the names and addresses of public and private landowners who provide public access to affected waterways.

## **8.3.2 Water Quality/CSO Hotline**

The City maintains a pre-recorded telephone line to provide information to citizens about river water quality. The pre-recorded message on the line is updated weekly in the spring, summer and fall with information on the current known receiving water quality. This data comes from weekly biological sampling of the City's three rivers. The message also includes general information about CSOs and cautions about bodily contact with affected waters during and after wet weather events. The Water Quality/CSO Hotline number is included on CSO signage. The script for the weekly updates of the hotline can be found in Exhibit H-7.

## **8.3.3 Educational Flyer Program**

The City's Public Information Office and the Water Quality Specialist hired by the Partnership for Water Quality (more below) have produced various informational flyers on topics related to CSOs. Topics for flyers are generated by changes in regulations and inquiries from the public. The City has a number of speakers who can provide more information to neighborhood and community groups about various topics.

The City has chosen to use various information sources based on having a reasonable degree of assurance that the methods used will provide the necessary information to the appropriate audience. CSO signage may be effective for people who visit the location of a CSO outfall where they may come into contact with affected water. However, signs alone are not enough. It is the hope of the City that a sign – in addition to giving an immediate warning – might motivate someone to seek out additional info about the causes of CSOs and the City's CSO reduction program by calling the CSO Hotline phone number shown on the sign. We hope that picking up a flyer at the library or a grocery store might motivate a citizen to call the City and invite a speaker to their neighborhood or church group.

# Nine Minimum Controls – No. 8

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## 8.4 CSO PUBLIC NOTIFICATION PROGRAM

The City's CSO Public Notification Procedure is intended to meet requirements of the Indiana Administrative Code requiring that the City alert members of the public who may be immediately affected by a CSO discharge. The program provides notice that CSO discharges are occurring or may potentially occur and enables members of the public to protect themselves from possible exposure to waterborne pathogens that may result from contact with or ingestion of water from a waterway that is potentially affected by a CSO discharge. A copy of the CSO Public Notification Procedure may be found in Exhibit H-2.

The procedure for accomplishing this notification has three components: 1) determining when CSO events are occurring or are eminent; 2) providing notification through various methods; and 3) record keeping and reporting.

### 8.4.1 Determining CSO Events

For the purposes of providing notification, CSO events are based on regular visual examination of CSO outfalls, monitoring local weather forecasts and available real-time precipitation data and monitoring release of water from the City's CSO storage ponds.

If visual inspection reveals that CSO events are occurring, the necessary steps to implement notification are taken. The City's engineering staff has determined that a CSO event can occur as the result of one-tenth of an inch (0.10") of rain. If any of the identified on-line sources of weather information reveal precipitation amounts of equal to or greater than one-tenth of an inch of rain, notification procedures are implemented. Finally, release of water from the City's CSO ponds that exceeds permit requirements triggers the notification process.

### 8.4.2 Notification Procedure

The City has established an automated e-mail service that allows individuals and groups to request e-mail notification of conditions where CSO releases are occurring or are likely to occur. When conditions established as described above occur, an e-mail notice is immediately sent to anyone who has requested such notification. In March of each year, information is sent to the City's two major newspapers detailing what steps individuals should take to register for this e-mail notification. Steps to request notification are also available on the City's website.

CSO signage at CSO outfalls and other locations where public access to potentially affected waters is either allowed or likely to occur (as described above) is another important part of the notification procedure. The City will continue to expand the CSO signage program, placing signs at public access

## **Nine Minimum Controls – No. 8**

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points, along the City's River Greenway and at other locations identified by the Sewer Advisory Group that might provide public access to affected waters. In addition, staff members from the City and the neighboring community of New Haven will contact the owners of both public and private properties that provide public access to known CSO affected waters and offer to provide free CSO signage.

As outlined in the CSO Public Notification Procedure included in Exhibit H-2, the City public information staff also coordinates with local media outlets and provides CSO notification information through the method selected by the individual newspaper, radio or television station. This allows each media outlet to select the method of notification that best suits their newsroom's operation and deadlines. Because the notification is provided each year in March, media outlets can revise the method by which they receive notice on an annual basis.

### **8.4.3 Reporting and Record Keeping**

City staff use a Public Notification Log to record all monthly activities associated with the CSO Public Notification Procedure. Data included in the log:

- Locations of all CSO signage
- Dates when each sign was erected
- Dates of all CSO notifications and the events that caused the notification to be issued
- Dates of any documented CSO events for which notification was not given
- Contact list of all who are currently on the list to receive notification
- Names and addresses of all public and private property owners who provide public access to affected streams and the date when letters were sent notifying them of free CSO signage

This information will be summarized and kept at Exhibit H-3. A sample format for the annual summary may be found in Exhibit H-3. The information will also be summarized annually and made available for public inspection on the City's website at [www.cityoffortwayne.org](http://www.cityoffortwayne.org).

# Nine Minimum Controls – No. 8

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## DIRECTORY FOR APPENDIX H (Items Presented in Order of Appearance in Appendix H)

<u>Item</u>	<u>Description</u>
Exhibit H-1	SAMPLES OF EDUCATIONAL MATERIAL
Exhibit H-2	CSO PUBLIC NOTIFICATION PROCEDURE
Exhibit H-3	ANNUAL REPORT OF EDUCATION AND PUBLIC
Exhibit H-4	LIST OF AVAILABLE EDUCATIONAL MATERAIL
Exhibit H-5	CONTACTS FOR EDUCATIONAL ACTIVITIES
Exhibit H-6	SAMPLE OF A CSO SIGN
Exhibit H-7	WATER QUALITY HOTLINE

# **Nine Minimum Controls – No. 8**

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## **EXHIBIT H-1**

# Samples of Educational Material

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# BIOSOLIDS RECYCLING

AN ENVIRONMENTALLY SOUND WAY TO PUT A VALUABLE RESOURCE TO WORK FOR ALL OF US



**BIOSOLIDS RECYCLING**  
AN ENVIRONMENTALLY SOUND WAY TO PUT A VALUABLE RESOURCE TO WORK FOR ALL OF US.

Everyone knows that recycling benefits the environment. Communities across North America have joined together to conserve our natural resources by recycling everything from glass and plastics to paper and metal.

Wastewater treatment facilities in big cities and small towns also understand the importance of recycling. Facilities like the one in your community reclaim safe, nutrient-rich organic material called BIOSOLIDS from the millions of litres of wastewater they treat each year. Biosolids are used for everything from helping to fertilize the lawn of the White House to producing greater crop yields for farmers.

In fact, almost half of all biosolids produced are being recycled, compared to only about one-tenth of all household solid waste.

BIOSOLIDS RECYCLING is part of our daily lives.

BIOSOLIDS are a byproduct of specially treated, stabilized and disinfected water that may have originated from household wastewater, industrial wastewater, and stormwater runoff. And the more we succeed in cleaning our water, the more biosolids we can produce and put to beneficial use.



**BIOSOLIDS RECYCLING**  
MEETS STRICT QUALITY STANDARDS AND SCIENTIFIC CONTROLS.

Recycling biosolids for beneficial use means control and safety. Pretreatment regulations that industrial plants treat or remove any nutrients from their wastewater before it is discharged to a municipal treatment plant.

During wastewater treatment, regular testing the high quality of biosolids. And specifically, treatments minimize any potential odor with biosolids.

In the United States, all biosolids recycling must meet strict quality criteria and regulations set by the Environmental Protection Agency (EPA). These are based on EPA's rigorous review of long-term scientific studies regarding the safety and efficacy of biosolids recycling.

The U.S. Department of Agriculture and Food and Drug Administration also encourage beneficial use of biosolids.

In Canada, agricultural land application of biosolids must meet strict quality criteria set by each of the provincial and territorial Environment Ministers. The federal use of biosolids in Canada is encouraged by the Ministry of Agriculture and Food and the Ministry of Health at both the provincial and federal levels.

Water Environment Federation  
601 Wythe Street  
Alexandria, VA U.S.A. 22314-1994



## BIOSOLIDS RECYCLING PRESERVES OUR NATURAL RESOURCES AND IMPROVES OUR ENVIRONMENT.

**Biosolids recycling** offers a number of benefits to communities everywhere.

**PREVENTING SOIL EROSION:** Biosolids recycling helps stop soil erosion by encouraging water to enter the ground and allowing the soil to hold more water for increased plant growth.

**IMPROVING TIMBER GROWTH:** Biosolids recycling is important in landscaping and forest fertilization efforts in areas that are harvested to produce lumber for homes. One study showed that trees fertilized with biosolids grew twice as fast as those from untreated areas.

**SAVING DIMINISHING LANDFILL SPACE:** Biosolids recycling preserves rapidly decreasing landfill space. Putting biosolids to productive use saves limited space for materials that should be placed in a landfill.

**STRENGTHENING RECLAMATION EFFORTS:** Biosolids recycling can be used to reclaim strip-mined lands and grow vegetation on once-contaminated U.S. Superfund sites.

**ENHANCING LANDSCAPING AND GARDENING:** As an organic fertilizer, biosolids products provide nutrient-rich materials used in home and community gardens. Biosolids recycling has also been used to landscape golf courses, public parks and recreation areas.

## ...AND BIOSOLIDS RECYCLING MAKES ECONOMIC SENSE.

1186

**HIGHER YIELDS:** In farming, biosolids recycling has been shown to produce significant improvement in crop growth and yield.

**LOWER COSTS:** Biosolids recycling can be a efficient complement to chemical fertilizers. Materials are supplementing fertilizers that contain inorganic chemicals with biosolids.

**GREATER SAVINGS:** The increase of biosolids recycling enables local governments to market byproducts and helps to offset the costs of clean water quality to their citizens.

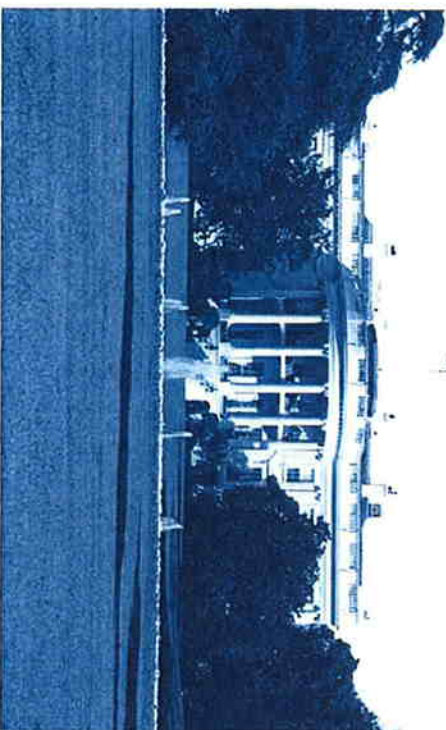
## BIOSOLIDS RECYCLING WHAT YOU CAN DO?

Learn more about biosolids recycling in your community by contacting your local wastewater treatment

Department of Public Affairs at the Water Environment Federation:

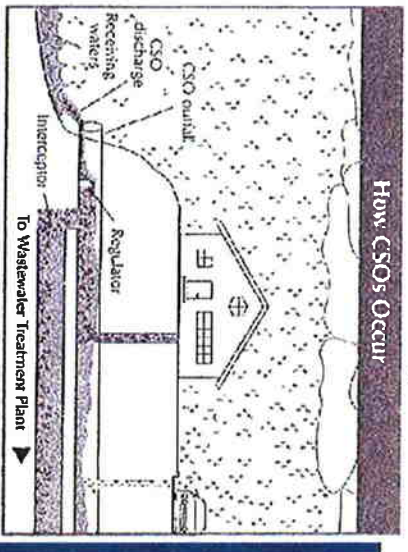


Water Environment Federation  
601 Wythe Street  
Alexandria, VA U.S.A. 22314-1994  
1 (703) 684-2400



## What is a Combined Sewer Overflow?

Fort Wayne, New Haven, and over 100 other communities throughout Indiana collect both rainwater runoff and sanitary wastewater in the same set of sewer pipes. These are called "combined sewers." Sometimes when it rains, combined sewers do not have enough capacity to carry all the rainwater and wastewater or the Water Pollution Control Plant cannot accept all of the combined flow. In this situation, the combined wastewater overflows from the collection system into the nearest body of water, creating a combined sewer overflow (CSO). The main pollutants in CSOs are untreated human wastes, toxic materials like oil and pesticides, and floating debris that may wash into the sewer system. These pollutants can affect your health if you swim in CSO-polluted water or if you eat fish that have been contaminated by the CSOs.



## How Expensive Are CSO Control Measures?

The costs of combined sewer overflow controls may be high in some areas and low in others. The severity and frequency of the CSO occurrences and their effect on river water quality will determine the types of CSO controls and their cost. In Fort Wayne, the actual cost to control CSOs is not known, but is estimated to be \$250 million over the next 25 years. In New Haven, total cost is expected to be in excess of \$9.5 million. Preventative maintenance programs, including regular inspection and cleaning of sewer lines, and capital improvements underway to increase sewer capacity in many neighborhoods served by combined sewers will go a long way toward meeting state and federal CSO requirements.

## Who To Contact

The Allen County Partnership for  
Water Quality

3718 New Vision Drive  
Fort Wayne, IN 46845

Phone: 260-484-5848 ext. 111  
Fax: 260-484-5080

Combined Sewer Overflow Hotline

260-427-2297

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Allen County  
Partnership for Water  
Quality

**COMBINED  
SEWER  
OVERFLOW**



*A Reference Guide  
for Homeowners*



City of Fort Wayne • City of New Haven •  
Allen County

## How Are CSOs Controlled?

The Clean Water Act requires the U.S. EPA and Indiana Department of Environmental Management (IDEM) to issue permits with requirements for controlling discharges from CSOs. The cities of Fort Wayne and New Haven are responsible for implementing a series of minimum CSO controls and developing and implementing a long-term CSO control plan to protect river water quality. The minimum CSO controls require communities to (1) maximize the use of the sewer collection system and the existing capacity of the wastewater treatment system, (2) reduce the amount of pollutants entering the combined sewers and (3) control as much solid and floatable material as possible from the CSOs. Fort Wayne and New Haven have each developed a long-term CSO control plan to identify, evaluate and implement various control strategies and achieve various water quality standards. Some of these controls include increased sewer capacity for storage, increased capacity at the Water Pollution Control Plant to treat more combined sewage and mechanisms to treat flow at the point where it enters the river.

## What Can I Do?

There are several ways you can affect the quality & quantity of water that flows into the sewer system:

- ◆ **Reduce Impervious Surfaces** Surfaces such as roofs, driveways and concrete patios do not allow rainwater to filter back into the soil, forcing the water into stormdrains. Instead of concrete patios, asphalt driveways, and paved paths, try wood decks, gravel or pervious asphalt driveways, and mulched paths.
- ◆ **Responsible Lawn Care** When applying chemicals to your lawn, follow the manufacturer's directions to avoid over-applying; these chemicals can runoff into the sewer system and degrade our rivers.
- ◆ **Conserve Water** Using less water on your lawn and garden means less chemical runoff into the stormdrains. Using less water in your home means less water in the sewer system, making overflows during wet weather less likely.
- ◆ **Don't Misuse Stormdrains** Remember that stormdrains are not trash cans. Household hazardous waste (HHW) such as motor oil, antifreeze and many cleaning agents should be disposed of properly at a HHW collection facility.
- ◆ **Support Local Efforts** Support the efforts of your local government to control CSOs, and understand that there are a multitude of ways you can be involved in protecting your water quality.
- ◆ **Become Informed** Take interest in your community's water quality. Pay attention to signs posted at river access points informing residents of the risk of CSOs. Call the City of Fort Wayne's CSO and Water Quality Hotline to hear the latest information on CSOs and drinking water quality. Or call the ACPWQ for more information.

## Storm Drain

### Marking

Does your neighborhood association, school or civic group want to be involved in cleaning up your community's stormwater? Become



part of the Allen County Partnership for Water Quality's *Storm Drain Marking Program*. By affixing a special "No Dumping, Drains to River" emblem on storm

sewers, residents and passers by become aware that what flows down those drains is not treated before reaching the river. The ACPWQ will provide all materials and instruction necessary to mark these drains, so call today to become part of a program that will serve for many years as an important reminder to keep garbage, chemicals and hazardous waste out of the sewer system.

If you would like to be notified of a CSO event, sign up for the CSO Notification List. You will be notified via e-mail when a CSO event has occurred or is expected to occur. Please note that during a CSO event special caution should be taken to avoid contact with the listed affected waters.

To sign up for Fort Wayne's list, visit:

[http://www.cityoffortwayne.org/cso\\_list.asp](http://www.cityoffortwayne.org/cso_list.asp)

## WHY SHOULD I CARE ABOUT STORMWATER?

Every time it rains, water that is not absorbed by the ground runs off rooftops, lawns, driveways, and streets, picking up hazardous materials such as oil and antifreeze, fertilizers and pesticides, litter, pet waste and other pollutants. This stormwater is not treated by the water pollution control plant but is deposited directly into the rivers and streams.

Uncontrolled stormwater can affect your quality of life by negatively affecting the quality of water in the rivers and streams in your community. It can impact wildlife in the area and create an unhealthy habitat. Erosion of sediment into the water can block light from aquatic plants, fill the niches where fish lay eggs and clog fish gills. Polluted stormwater can affect the process by which our drinking water is filtered, causing the water filtration plant to do more extensive filtering and chlorinating.

## WHAT CAN I DO?

There are several ways you can affect the quality & quantity of water that flows into the sewer system:

- **Responsible Lawn Care** When applying chemicals to your lawn, follow the manufacturer's directions to avoid over-applying; these chemicals can runoff into the sewer system and degrade our rivers and streams.
- **Don't Misuse Stormdrains** Remember that stormdrains are not trash cans. Household hazardous waste (HHW) such as motor oil, antifreeze and many cleaning agents should be disposed of properly at a HHW collection facility.



- **Support Local Efforts** Support the efforts of your local government to improve stormwater quality and quantity, and understand that there are a multitude of ways you can be involved in protecting your water quality.
- **Don't be a Litter Bug** Put trash in its place, or it could end up in our rivers and streams.
- **Pick Up Pet Waste** Pick up your pet's waste and dispose of it in your toilet or trash so that it doesn't wash into the stormdrains.
- **Conserve Water** Using less water on your lawn and garden means less chemical runoff into the stormdrains.
- **Reduce Impervious Surfaces** Surfaces such as roofs, driveways and concrete patios do not allow rainwater to filter back into the soil, forcing the water into stormdrains. Instead of concrete patios, asphalt driveways and paved paths, try wood decks, gravel or pervious asphalt driveways and mulched paths.

## STORM DRAIN MARKING

Does your neighborhood association, school or civic group want to be involved in cleaning up your community's stormwater?



Become a part of the Allen County Partnership for Water Quality's Storm Drain Marking Program. By affixing a special "No Dumping, Drains to River" emblem on storm sewers, residents and passersby become aware that what flows down those drains is not treated before reaching the river. The ACPWQ will provide all materials and instruction necessary to mark these drains, so call today to become part of a program that will serve for many years as an important reminder to keep garbage, chemicals and hazardous waste out of the sewer system.

### WHY DOES THE CITY CHARGE A STORMWATER FEE?

The City of Fort Wayne developed the stormwater fee to ensure proper control and treatment of stormwater in order to address unnecessary flooding, erosion and sedimentation caused by rain, to improve the overall quality of water and to comply with the federal environmental regulations that govern stormwater.

### WHO IS REQUIRED TO PAY?

All properties within city limits having impervious surfaces such as asphalt, concrete, stone, building rooftops, etc., which generate stormwater runoff, are assessed a stormwater user fee. This includes all residential and non-residential customers, i.e. commercial, industrial, institutional, churches, schools, businesses, and governmental facilities.

### HOW IS EACH PROPERTY CHARGED FOR STORMWATER?

Each residential property is charged a flat rate of one ERU (equivalent residential unit) of \$2.20 a month. Each non-residential property's stormwater bill is based on their total square footage of impervious surface divided by the base ERU of 2500 square feet, multiplied by \$2.20.

### WHY SHOULD I HAVE TO PAY A STORMWATER FEE IF I DON'T HAVE A STORM SEWER?

Every property with impervious area produces increased stormwater runoff that Fort Wayne must manage. Your runoff, although small, may be joining with that from other properties to cause flooding downstream. Even where there are no storm sewers, water flows over land and discharges into the rivers and streams. The City's 600 miles of storm sewers help keep traffic moving on streets and highways, businesses and industries operating and lives and property safe by reducing neighborhood flooding.

## RIVER CLEAN UP

Join the thousands of Fort Wayne residents who have participated in the River Clean Up! Your church, school or civic group can enter, or simply come alone to join with other involved citizens. This event takes place during the spring and summer months, so call the Allen County Partnership for Water Quality or the City's Solid Waste Department for more information on how you can keep litter out of the rivers!

## Who To Contact

The Allen County Partnership  
for Water Quality

3718 New Vision Drive  
Fort Wayne, IN 46845

Phone: 260-484-5848 ext. 111  
Fax: 260-484-5080

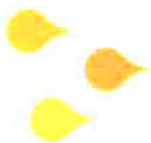
City of Fort Wayne Solid Waste Department  
260-427-1270

City Utilities Customer Service  
260-427-1234

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Allen County  
Partnership for Water  
Quality

## STORMWATER POLLUTION



*A Reference Guide  
for Homeowners*



*City of Fort Wayne • City of New Haven •  
Allen County*

## What's in Your Home?



These are just some of the household hazardous wastes found in most homes:

- ✦ **Kitchen:** Aerosol cans (full), floor care products, furniture polish, metal polish.
- ✦ **Bathroom:** Nail polish, nail polish remover.
- ✦ **Garage:** Antifreeze, automotive batteries, brake fluid, car wax with solvent, diesel fuel, oil, gasoline, kerosene, metal polish with solvent, motor oil, transmission fluid, windshield washer solution.
- ✦ **Workshop:** Paint brush cleaner with solvent, paint brush cleaner with TSP (Trisodium phosphate), glue (solvent based), mineral spirits, oil based paint, automotive paint, thinner, paint stripper (solvent), primer, rust remover, turpentine, varnish, wood preservative.
- ✦ **Garden:** Fungicide, insecticide, rat/mouse/gopher poison, weed killer.
- ✦ **Here & There:** Household batteries, dry cleaning solvents, fiberglass epoxy, gun cleaning solvents, lighter fluid, moth balls, unmixed photographic chemicals, septic tank degreasers, swimming pool chemicals.

## SAFER ALTERNATIVES!

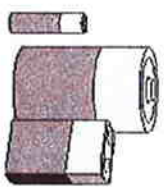
Here are some safer alternative products that will get the job done well:

- Air Freshener:** An open box of baking soda absorbs refrigerator odors. For garbage cans, sprinkle boric acid in the can.
  - Antifreeze:** Look for the new, less toxic brands on the market.
  - Batteries:** Select the very-low mercury brands (99.5% mercury free) that are becoming widely available.
  - Drain Opener:** To prevent clogs, pour in 1/4 cup baking soda followed by 1/2 cup vinegar. When fizzing stops, flush with boiling water.
  - Rust Remover:** Vinegar's weak acid works well on rust stains.
  - Window Cleaner:** Wipe clean with a mixture of 3 Tbs. vinegar in 7 quarts of water.
  - Wood Furniture Polish:** Combine 1 part lemon juice with 2 parts olive oil.
- Contact the ACPWQ for a more complete list of safe alternatives to common cleaning and household products.

## Bulbs & Batteries & Thermometers... Oh My!!

Why wait for Tox Away Day to rid your home of these items? Disposal sites are available year-round for:

- ✦ **Fluorescent Bulbs:** These bulbs contain mercury and should not be put out for your weekly trash pick-up. 4-foot bulbs can be taken to the Merchandise Pick-Up Area at the Glenbrook Sears during normal business hours.



- ✦ **Batteries:** Material in most household batteries is harmful to the environment and should be recycled properly. Drop off old batteries at Batteries Plus for proper recycling.

- ✦ **Mercury Thermometers:** Some families have not yet replaced these thermometers with newer, safer types. Do not throw these away! Instead, dispose of them safely at the Fort Wayne-Allen County Department of Health Immunization Clinic, M-F, 8am-4pm.

- ✦ **Electronic Equipment:** When replacing your electronic equipment with newer models, recycle them properly so the metals contained do not contaminate our water and soil. Take your computers and electronic equipment to OmniSource for a minimal fee.

## What is Household Hazardous Waste?

Leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients are considered to be "household hazardous waste" or HHW. Products that contain hazardous ingredients are safe to use when you follow the manufacturer's instructions, but require special care when you dispose of them. If disposed of improperly, these wastes can pollute the environment and pose a threat to human health.

### Have You Ever...

- ☛ Poured used motor oil or antifreeze on the ground?
- ☛ Thrown away dead batteries in the trash?
- ☛ Emptied a partial can of paint thinner down the drain?

Doing this only once or twice may not seem like a big deal, but if everyone in Allen County did this, those small amounts could equal a BIG water quality problem. The average Indiana household contains between 3 and 10 gallons of hazardous wastes! If this waste isn't disposed of properly, it could contaminate our rivers and streams.

## Tox Away Day

The Allen County Solid Waste Management District holds a yearly Tox Away Day for residents of Allen County to properly dispose of their household hazardous waste. The event takes place in early September, and minimal fees apply. For residents who want to properly dispose of old tires, contact the District for information about the annual Tire Amnesty Day.

## Who To Contact

### Allen County Partnership for Water Quality

2010 Inwood Drive, Suite 103  
Fort Wayne, IN 46815  
Phone: (260) 426-4637 ext.3  
Fax: (260) 424-9209

**Allen County Solid Waste Management District**  
1 Main Street, Room B86  
Fort Wayne, IN 46802  
(260) 449-7878

## Allen County Partnership for Water Quality

# HOUSEHOLD HAZARDOUS WASTE



## A Reference Guide for Homeowners



*City of Fort Wayne • City of New Haven • Allen County*

## Taking Care of Your Septic System

### Use Water Wisely

When the septic system's absorption field is waterlogged, its ability to treat waste is hindered.

- ◆ When it's feasible, conserve water and allow time between activities that require a lot of water, like using washing machines & dishwashers, and taking baths & showers.
- ◆ Consider using a front-loading washing machine, which can use up to 1/3 less water than top-loading washers.
- ◆ Toilets consume large amounts of water and most use 3-5 gallons per flush. Install a water-saving design that uses only 1.5 gal/flush. For an older toilet, place a milk jug filled with sand or stones in the tank to reduce that amount of water used.
- ◆ To conserve water in the shower, install a low-flow shower head.

### Pump Your Septic Tank Regularly & Have Your Septic System Inspected Annually

- ◆ Pumping your septic tank removes solids and prevents them from clogging the absorption field. Have a professional pump out your septic tank every 3-5 years.
- ◆ Annual inspections will catch problems early, avoiding environmental contamination and possibly lowering the cost of repairs.

### Know What Not to Put Down the Drain

- ◆ Hazardous chemicals should never be rinsed down your drain; they may kill the bacteria and microorganisms working in your septic system to break down waste.
- ◆ Use garbage disposals sparingly, and avoid putting anything down the toilet or drain that will not easily break down. Solids build up in your septic tank and affect your system's ability to treat waste.
- ◆ Septic tank additives are generally not beneficial; some may actually harm the system.
- ◆ Fat, grease, or oil should never be rinsed down the drain.

## Who To Contact

### Allen County Partnership for Water Quality

2010 Inwood Drive, Suite 103

Fort Wayne, IN 46815

Phone: 260-426-4637 ext.3

### Fort Wayne - Allen County Department of Health

1 East Main Street, 5th floor

Fort Wayne, IN 46802

260-449-7530

[www.fw-ac-deptofhealth.com](http://www.fw-ac-deptofhealth.com)

## Is Your Septic System Failing?

There are several indicators that your septic system may not be functioning properly:

1. Slowly draining sinks and toilets
2. Gurgling sounds in the plumbing
3. Plumbing backups
4. Sewage odors in the house or out in the yard
5. The ground is wet or mushy above your absorption field
6. The grass is greener or grows faster above your absorption field
7. Tests show the presence of bacteria in nearby streams or wells



If your septic system exhibits any of these signs, contact a professional to assess the situation.

## What are Septic Systems?

Septic systems are individual wastewater treatment systems that use the soil to treat small wastewater flows, usually from individual homes. They are typically used in rural or large lot settings where centralized wastewater treatment is impractical.

A typical system consists of two major components, a septic tank and an absorption field. This system treats your household wastewater by temporarily holding it in the septic tank where heavy solids and lighter scum are allowed to separate from the wastewater. This separation process is known as primary treatment. The solids stored in the tank are decomposed by bacteria and later removed along with the lighter scum by a professional septic tank pump.

### Septic Tank

Three factors determine how often your septic tank will have to be pumped. The *first* factor is the size of the tank itself. A typical tank is designed to hold 1,000 gallons of liquid. The *second* factor is the number of people in the household. Obviously, the more people in the household, the more wastewater will flow through the system. The *third* factor is the volume of solids in the waste water. For example, if you have a garbage disposal in your house, then you will have to pump out your tank more frequently than those who dispose of their garbage by other means.

### Absorption Field

An absorption field generally does not require any maintenance. However, to protect and prolong the life of the absorption field, follow these simple rules:

- ❖ Do not drive or park over the absorption field with cars, trucks, or heavy equipment; compaction of the field will reduce its ability to filter and treat wastewater.
- ❖ Do not plant anything but grass over the system. Roots from trees and shrubbery may clog your absorption field, preventing it from properly treating waste.
- ❖ Divert surface runoff water from roofs, patios, driveways, and other areas away from the absorption field. Keep sump pumps and house footing drains away from the system as well.

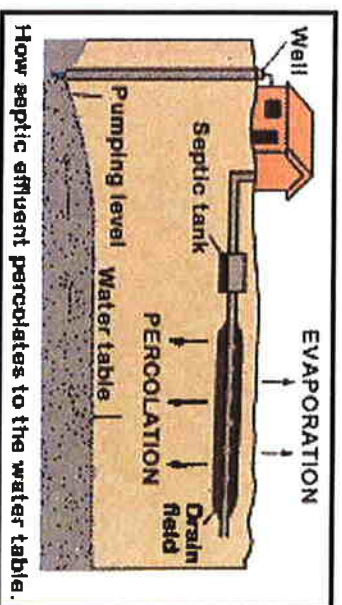
## Why Maintain Your Septic System?

Failing septic systems are very expensive to repair or replace. Compare: \$50-\$250 to have your septic system inspected or pumped; \$3000-\$10,000 to have it repaired or replaced.

A neglected septic system could reduce the value of your property.

A failing septic system can cause a serious threat to the health of family members and neighbors, especially if your drinking water comes from a well.

A failing septic system can degrade the environment, especially nearby waterways. It can put thousands of water users at risk if it is located near a public water supply. The picture below illustrates how septic effluent can reach a groundwater supply.



Allen County  
Partnership for Water  
Quality

SO NOW YOU  
OWN A SEPTIC  
SYSTEM...



A Reference Guide  
for Homeowners



City of Fort Wayne • City of New Haven •  
Allen County



## Test Your Soil

To determine what kind of care your lawn and garden need, you must first determine what type of soil you have! You can avoid spending excess time and money on your yard by having the soil tested for nutrients and pH. Correcting a problem before planting is much simpler and cheaper than afterwards. Once your yard is established, continue to take periodic soil samples. You can purchase a home test for pH, nitrogen, phosphorous, and potassium at a garden center. You can also contact a commercial testing service if you would like more detailed or special tests.

## Use Biosolids & Compost

**Biosolids** are nutrient-rich organic materials, resulting from the wastewater treatment process, which can be applied as fertilizer. Applying biosolids to land before planting grass or a garden can provide nutrients vital to plant growth and reduce the amount of chemical fertilizers needed. Biosolids are available at the Lake Ave. biosolids facility (*information located at right*).

**Composting** is the controlled decomposition of organic matter by microorganisms into a humus-like product. Compost can enhance soil texture, increase the ability of the soil to absorb air and water (thus using less water), suppress weed growth, decrease erosion, & reduce the need to apply fertilizers. With all of these benefits, how can you afford to not use biosolids and compost?

## Choose Native Plants

Native plants are well-suited to their area. They provide food and shelter for wildlife while usually requiring less water, fertilizer and pesticides than non-native species. Their lower maintenance and high conservation value make them a good choice for an environmentally conscious homeowner. Ask your local garden center for some native plant choices.

## Conserve Water

Using less water means less chemical runoff and soil erosion. Water deeply to promote deep root growth, and water in the early morning to avoid evaporation.

**Q:** What do I do with the yard waste my healthy, environmentally friendly lawn has created?

**A:** RECYCLE it at home or at a yardwaste compost site!

**Biosolids, Lime, & Yard Waste Recycling**  
6202 Lake Avenue 260-749-8040  
OPEN: April 1 - Nov. 30, M-Sat 8am-6pm  
Sun Noon-6pm  
Dec. 1 - March 31, Mon-Fri 8am-2pm  
Closed Holidays

**National Serv-All**  
6231 MacBeth Road 260-747-4117  
OPEN:  
Monday- Friday: 8am-5pm  
Saturday: 8am- Noon  
Closed Sundays & Holidays

Materials Accepted	Not Accepted
Garden Waste	Construction Debris
Leaves	Cement
Grass	Dirt
Brush	Fruit from Trees
Prunings	Lumber
Weeds	Railroad Ties
Vines	Wood Fencing

The average 1-acre lawn requires \$700 & 40 hours of work a year to maintain!!

## You Are the Solution to Water Pollution

Protecting water quality through responsible lawn and garden care is not something every homeowner considers when landscaping and maintaining his or her yard. But the flow of water does not obey your property lines. Water that flows onto and off of your land is part of a watershed that inevitably reaches a stream or river. If you knew that a child was playing in that stream, or that the water reaching that river would be used for your community's water supply, would it change the way you cared for your land? You can ensure that the water that nourishes your land does not pollute the river it reaches. Small changes in the way you maintain your lawn and garden can make a BIG impact in water quality. Practicing responsible lawn care today can protect our water quality tomorrow.

## Who To Contact

The Allen County Partnership for Water Quality

2010 Inwood Drive, Suite 103  
Fort Wayne, IN 46815

Phone: 260-426-4637 ext. 3  
Fax: 260-424-9209

## Reduce Impervious Surfaces

Impervious surfaces, such as roofs, driveways, and concrete patios, do not allow rainwater to filter back into the soil. Try incorporating a surface into your lawn or garden area that allows the rain water to reach the soil, rather than run into the storm sewers during a heavy rain. Instead of concrete patios, asphalt driveways, and paved paths, try wood decks, gravel or pervious asphalt driveways, and mulched paths. Instead of diverting stormwater to drains, collect the water in rain barrels for later use in your garden! It's easy to be a "green gardener."

### ☞ Recipe for Compost ☞

Mix together and moisten and turn occasionally until dark and crumbly (several weeks to a year):

1 part "green" = fresh grass clippings, manure, garden plants, and fruit and vegetable scraps (no meat, dairy, or fat)

3 parts "brown" = dried leaves and plants, branches, and woody materials

Use the compost around trees, shrubs, perennials, and even house plants to deter weeds, improve soil structure and retain moisture.

## Allen County Partnership for Water Quality

## GREEN LANDSCAPING



## A Reference Guide for Homeowners



City of Fort Wayne • City of New Haven •  
Allen County

## Safety Measures to Protect your Family from Diseases Related to Flood Waters



The following safety measures will help reduce the risk of your family and pets contracting diseases associated with sewage-contaminated floodwaters.

- ◆ Avoid direct contact with flood or back-up water when possible. Children and pets should not play or come in contact with floodwater.
- ◆ When cleaning up flooded areas, wear protective clothing and gear, such as latex gloves and waterproof, impenetrable rubber boots to prevent exposure to sewage. Contact the Department of Public Health to receive protective rubber gloves.
- ◆ Use a disinfectant solution of laundry bleach (5.25% hypochlorite) for clean up. You can make this disinfectant solution by mixing one part laundry bleach, such as Clorox, with nine parts water.
- ◆ After cleaning up, make sure to do the following before removing protective latex gloves.
  1. Sanitize or dispose of aprons and other clothing worn during the clean up.
  2. Disinfect rubber footwear in a bucket using the bleach disinfectant described above.
  3. Disinfect buckets and other such materials used in the clean up, before storing them.
- ◆ Remove latex gloves from the inside-out and wash hands for at least two minutes with warm water and a disinfectant soap to assure all skin surfaces are clean of contaminants.
- ◆ Place disposables in a sealed plastic bag for garbage collection.

## Health Risks Associated with Sewage-Contaminated Flood Waters



Bacterial or viral pathogens may be present in sewage-contaminated floodwaters. The primary means by which people and animals may contract diseases from contaminated

floodwater is by fecal-oral transmission. Fecal-oral transmission occurs by either directly touching sewage or touching an object which has been in contact with sewage and then touching either the mouth, eyes, ears, or nose. Exposure can also occur by handling food products with sewage-contaminated objects, including improperly washed hands. Pregnant women, children, elderly persons, and those who are immunocompromised may be at higher risk. Following is a list of the most common fecal-oral transmitted diseases for this region and their symptoms.

- ◆ Amebiasis (Amebic Dysentery): intestinal disease with fever, chills and bloody or mucoid diarrhea.
- ◆ Epidemic Viral Gastroenteritis (Viral Diarrhea): nausea, vomiting, diarrhea, abdominal pain, myalgia, malaise, low-grade fever, or a combination of these symptoms usually lasting 24-48 hours.
- ◆ Giardiasis (Giardia Enteritis): chronic diarrhea, abdominal cramps, bloating, frequent loose, pale greasy stools, fatigue and weight loss.
- ◆ Viral Hepatitis A: fever, malaise, anorexia, nausea and abdominal discomfort followed within a few days by jaundice.
- ◆ Salmonellosis: fever, headache, abdominal pain, diarrhea, nausea, and sometimes vomiting.
- ◆ Shigellosis: diarrhea accompanied by fever, nausea and sometimes toxemia, vomiting, cramps.

## How to Clean Buildings



Structures that have been flooded should be examined carefully before being used for living quarters to ensure that they are safe and will not collapse. Building should also be thoroughly cleaned as follows:

- ◆ Buildings: Loose plaster should be removed from walls and ceilings. Doors and window sashes, should be removed and allowed to dry thoroughly. If water remains in the basement, it should be drained or pumped out as soon as possible. As the water is being removed, the mud should be stirred and carried away with it. After the basement has been allowed to dry thoroughly, wash the floors and walls with the chlorine disinfectant solution. Keep window open for ventilation. Chlorine solutions are corrosive, so use plastic containers to store and do not apply the disinfectant to metal surfaces.
- ◆ Walls, Woodwork & Floors: The walls and woodwork, while still damp, should be thoroughly scrubbed with a stiff fiber brush and water to remove all mud and silt. Particular attention should be given to all corners and cracks. Floors should be cleansed of all mud and dirt and allowed to dry thoroughly. Rugs that require shampooing should be washed with commercial rug shampoo products or with a mild soap jelly. Rugs and carpets should be stretched out on a flat surface and allowed to dry thoroughly to prevent molding, then subjected to beating, sweeping, or vacuum cleaning.

## Salvaging Household Items



**M**ost household items need to be inspected, cleaned, and dried before being reused.

- ♦ **Furnaces & Appliances:** Furnace and chimney pipe should be inspected and cleaned, if necessary, and furnace doors or covers left open to ventilate the system. All parts of the heating system that have been submerged, including the burners, need to be cleaned thoroughly to prevent clogging and dried well to prevent rusting. Stoves and other metal fixtures should first have all the mud and silt removed. They should then be wiped with an oiled rag, then polished and painted.

- ♦ **Furniture:** Furniture should be removed to the sunshine and fresh air and all the drawer slides and other working parts stacked separately. All of the mud and silt should then be removed. Care should be exercised to remove the furniture from direct sun before it warps.

- ♦ **Books:** Books should be allowed to dry carefully and slowly with alternate exposing to air and pressing. Toward the end of this treatment, the books may be subjected to small amounts of heat.

- ♦ **Clothing & Bedding:** Flood-soiled clothing and bedding require considerable care to obtain satisfactory results. All loose dirt should be brushed off, followed by laundering or dry cleaning in the usual manner. Lightweight comforters may be laundered in the same manner as blankets. Heavy comforters should be taken apart to be cleaned. Mattresses and pillows that are badly soiled may not be fit to reclaim; however, a professional may recondition those of good quality.

## Salvaging Food Items



**A**fter flooding, all food items which have been submerged need to be destroyed, unless they are stored in hermetically sealed, metal cans. Foods which are not stored in cans and have been exposed to sewage-contaminated floodwaters cannot be cleaned well enough to be consumed. This includes any foods which were stored in plastic or glass bottles. The contaminated food is very dangerous.

Food which is stored in metal cans can be cleaned and salvaged for consumption. First, remove labels and thoroughly wash cans in soapy water by scrubbing with a brush. Immerse containers in strong chlorine solution (1 oz. Chlorine bleach to 1 gallon clean water) for 15 minutes. Dry containers to prevent rusting.

## For Further Assistance & Information Call:

Aging & In-Home Services 745-1200

For Senior Citizens who are physically unable to properly clean contaminated areas resulting from sewer backups (Contact Person: Carla Ellsworth)

Fort Wayne-Allen County Board of Health 449-7530

For health and safety information, technical assistance, and latex safety gloves.

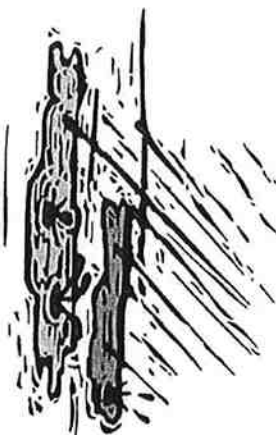
City of Fort Wayne Planning Department 427-1140

For other miscellaneous flood information

City of Fort Wayne Citizens' Advocates 427-1200

For information about your neighborhood association or Area Partnership or general questions.

## Dealing with Flood & Sewer Waters in Your Home



### Some Helpful Safety & Clean-up Information

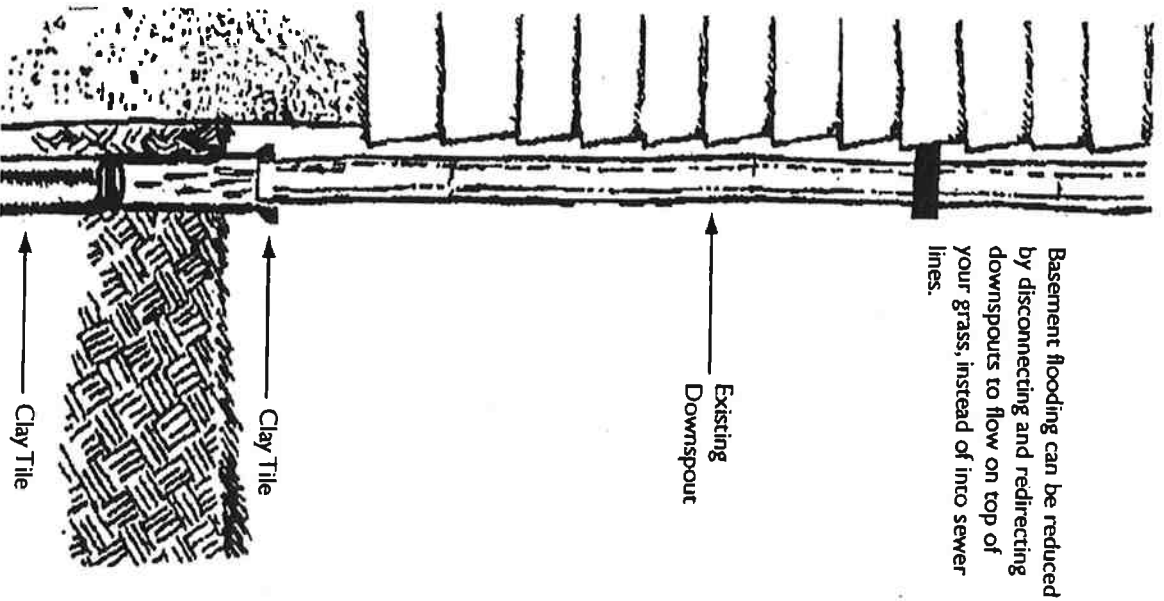
A Cooperative Effort of:  
 Fort Wayne Sewer Task Force  
 Fort Wayne Planning Department 427-1140  
 Fort Wayne City Utilities 427-1381  
 Indiana State Board of Health (317-383-6100)  
 Allen County Board of Health 449-7561



Graham Richard  
Mayor

## WHY SHOULD DOWNSPOUTS BE DISCONNECTED?

Downspouts that are connected directly to sewer lines can contribute to basement flooding.



## STEP-BY-STEP APPROACH FOR DISCONNECTING DOWNSPOUTS

1. **Shorten Existing Downspout:** Use hackaw to cut existing downspout.

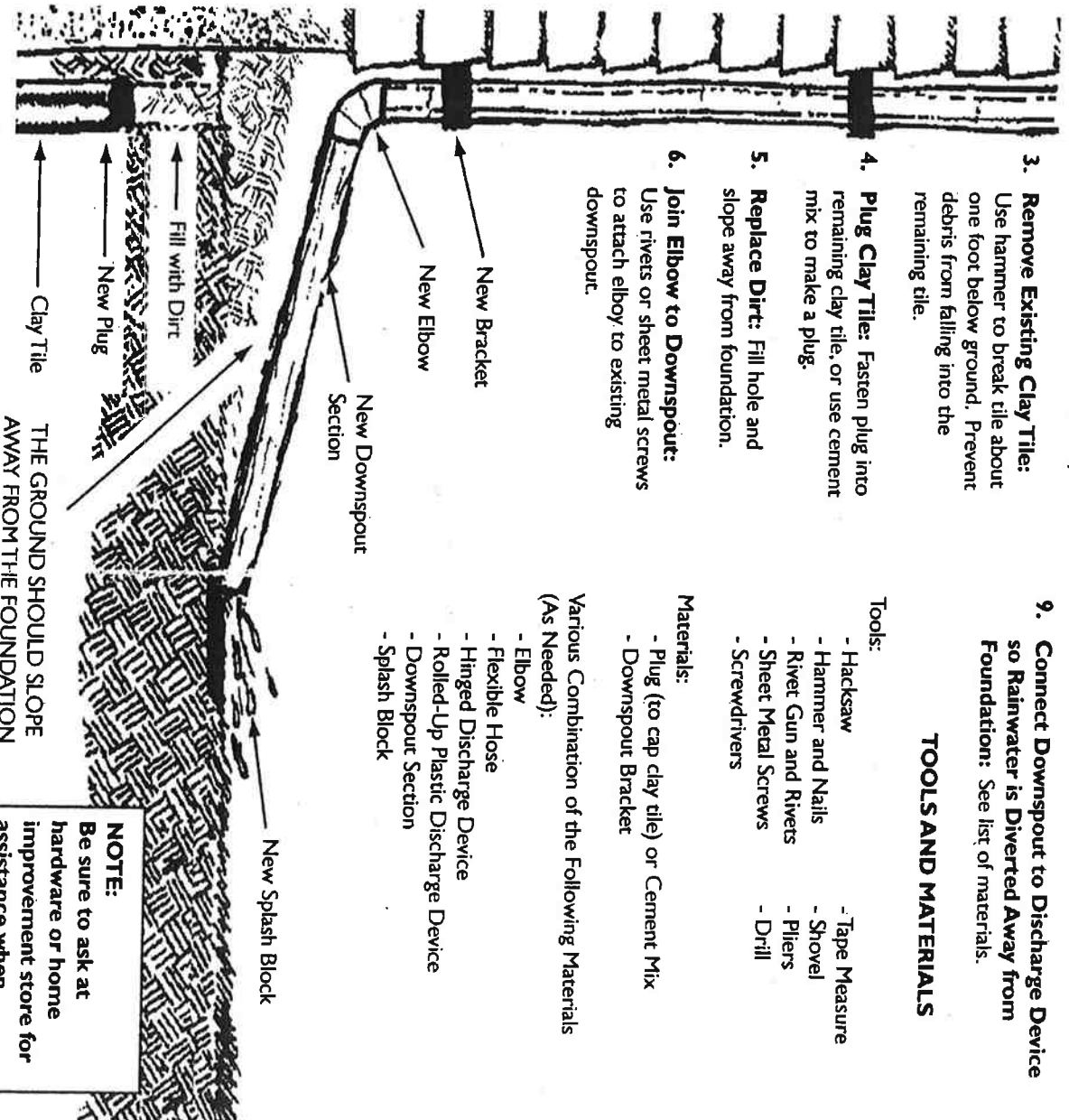
2. **Dig:** Remove dirt around clay tile.

3. **Remove Existing Clay Tile:** Use hammer to break tile about one foot below ground. Prevent debris from falling into the remaining tile.

4. **Plug Clay Tile:** Fasten plug into remaining clay tile, or use cement mix to make a plug.

5. **Replace Dirt:** Fill hole and slope away from foundation.

6. **Join Elbow to Downspout:** Use rivets or sheet metal screws to attach elbow to existing downspout.



7. **Fasten New Bracket:** Secure new downspout bracket to house with screws or nails.

8. **Cut:** After measuring the amount of downspout needed, but new downspout section to proper length - 4 to 6 feet.

9. **Connect Downspout to Discharge Device so Rainwater is Diverted Away from Foundation:** See list of materials.

### TOOLS AND MATERIALS

#### Tools:

- Hacksaw
- Hammer and Nails
- Rivet Gun and Rivets
- Sheet Metal Screws
- Screwdrivers
- Tape Measure
- Shovel
- Pliers
- Drill

#### Materials:

- Plug (to cap clay tile) or Cement Mix
- Downspout Bracket

Various Combination of the Following Materials (As Needed):

- Elbow
- Flexible Hose
- Hinged Discharge Device
- Rolled-Up Plastic Discharge Device
- Downspout Section
- Splash Block

**NOTE:**  
Be sure to ask at hardware or home improvement store for assistance when selecting materials.

**WHERE CAN YOU GET  
MORE INFORMATION?**

A video is available, showing an actual  
disconnection of a homeowner's downspout.



**Graham Richard, Mayor**

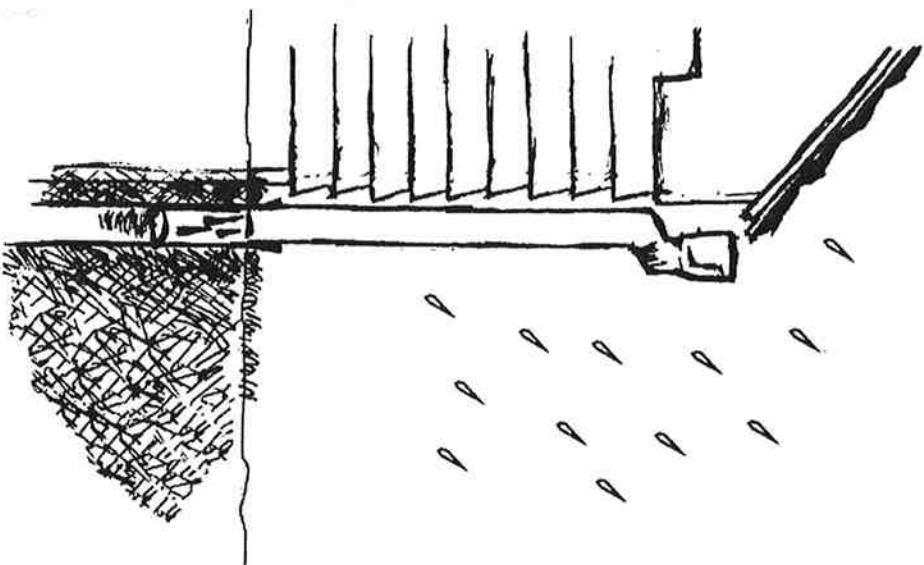
If you would like more information  
about the video, please contact:

Public Information Office  
at 427-1120

Fort Wayne City Utilities  
One Main Street, Room 280  
Fort Wayne, Indiana 46802



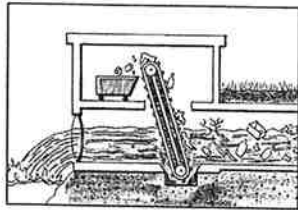
**STEP-BY-STEP  
DOWNSPOUT  
DISCONNECTION  
GUIDE**



**A Step-By-Step Guide to the  
Approach and Materials for  
Disconnecting Downspouts**

The Clean Water Act requires the U.S. EPA and Indiana Department of Environmental Management (IDEM) to issue permits with requirements for controlling discharges from CSOs. As part of its permit, Fort Wayne is responsible for implementing a series of minimum CSO controls and, if water quality standards are not met, developing and implementing a long-term CSO control plan to protect river water quality.

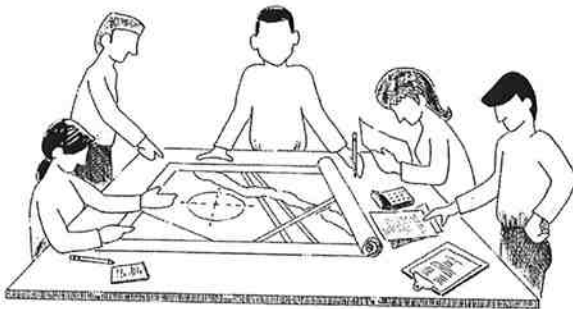
The minimum CSO controls require communities to (1) fully utilize the existing capacity of the wastewater collection and treatment systems, (2) prevent pollutants from entering the combined sewers and (3) remove as much solid and floatable material as possible from the CSOs. In some communities, the minimum controls may be adequate to achieve water quality standards.



*Install bar screens at CSO outfall locations.*



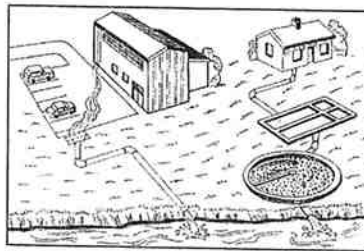
*Change operational practices.*



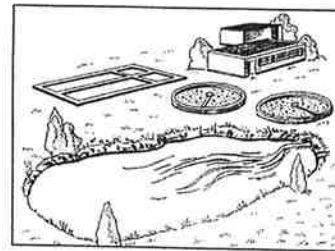
If CSO maintenance and management practices can't reduce pollution going to the three rivers, Fort Wayne may have to take additional actions. The City may need to develop and implement long-term CSO control plans.

If required, these control plans could require identification, evaluation and implementation of various control strategies to achieve required water quality standards. Some of these controls might include increased sewer capacity for storage, increased capacity at the Water Pollution Control Plant to treat more combined sewage or mechanisms to treat flow at the points where it enters the rivers.

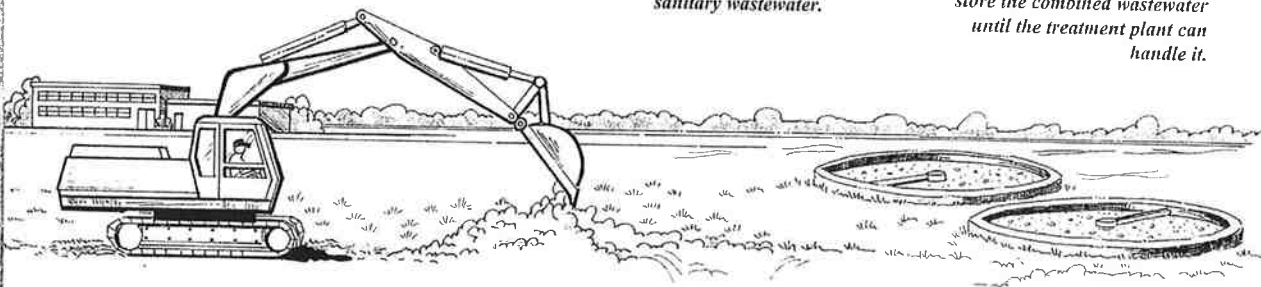
**LONG-TERM  
CSO PLANS MAY  
INCLUDE CONTROLS  
SUCH AS:**



*Separating stormwater from sanitary wastewater.*



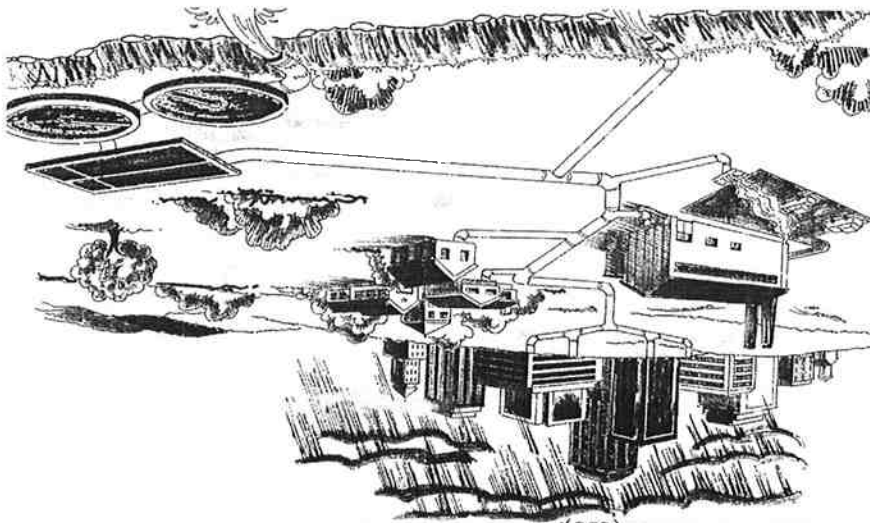
*Using basins, pipes or tunnels to store the combined wastewater until the treatment plant can handle it.*



*Constructing new treatment facilities.*

The costs of CSO controls may be high in some areas and low in others. The severity and frequency of the CSO occurrences and their effect on river water quality will determine the types of CSO controls and their cost.

Right now, the actual cost to control CSOs in Fort Wayne is not known. Preventive maintenance programs, including the regular cleaning and inspection of sewer lines, and capital improvements underway to increase sewer capacity in many neighborhoods served by combined sewers will go a long way toward meeting state and federal CSO requirements. Long-term changes in the combined sewer system may or may not be required based on the findings of river quality studies.



CSO controls protect the community's public health and its environment. For more information on Fort Wayne's Combined Sewer System Operational Plan or to arrange an informational presentation about combined sewer overflow issues and solutions, call Fort Wayne's Public Information Office at (219) 427-1120. For more information about the effects of CSOs on river water quality 24-hours-a-day, call the CSO Hotline at 424-1414, extension 1129.

**CONTROLLING CSOs IS VERY IMPORTANT**

Some cities, such as Fort Wayne, collect both rainwater runoff and sanitary wastewater in the same set of sewer pipes. These are called "combined sewers." Sometimes when it rains, combined sewers do not have enough capacity to carry all the rainwater and wastewater or the Water Pollution Control Plant cannot accept all of the combined flow. In this situation, the combined wastewater overflows from the collection system into the nearest body of water — in Fort Wayne's case, into one of the three rivers — creating a combined sewer overflow (CSO).

**WHAT IS A COMBINED SEWER OVERFLOW?**

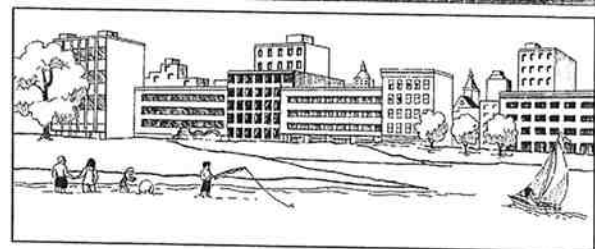
Fort Wayne City Utilities  
One Main Street, Room 280  
Fort Wayne, IN 46802

## WHERE ARE THE CSOs?



Combined sewers serve many communities especially in the northeast and Great Lakes region of the United States. Fort Wayne has a typical combined sewer system. In Fort Wayne, combined sewers are found mostly in the older part of the City. Fort Wayne has about 60 combined sewer overflow outfalls going to the three rivers and their tributaries.

## HOW DO CSOs AFFECT THE FORT WAYNE COMMUNITY?



*Control of CSOs is essential to preserving the public health and the ecological balance of our streams, rivers, lakes and oceans.*

During dry weather, combined sewers that serve the older part of Fort Wayne carry sanitary sewage from homes and businesses to the Water Pollution Control Plant. When it rains, however, and combined sewer overflows (CSOs) happen, river water quality may be impaired by the untreated wastewater that discharges from combined sewers into the City's three rivers.

The main pollutants in CSOs are untreated human and industrial wastes, toxic materials like oil and pesticides, and floating debris that may wash into the sewer system. These pollutants can affect your health if you swim in CSO-polluted water or if you eat fish or shellfish that have been contaminated by the CSOs.

The pollutants in CSOs can impair use of the rivers and cause a variety of bacteria-related illnesses. CSO pollutants are not just a human health concern. They can damage the environment for fish, shellfish and other aquatic life.

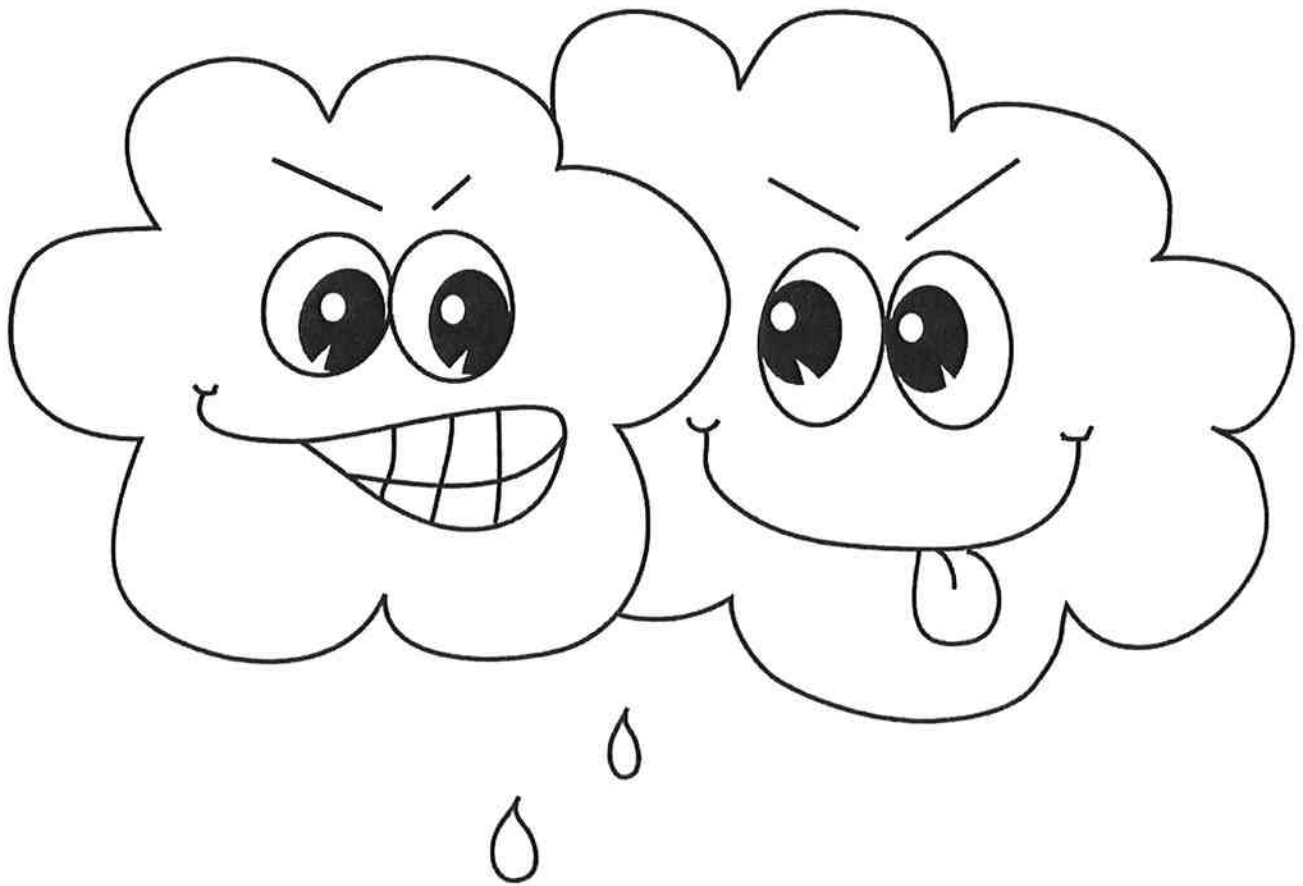


# STORM WATER

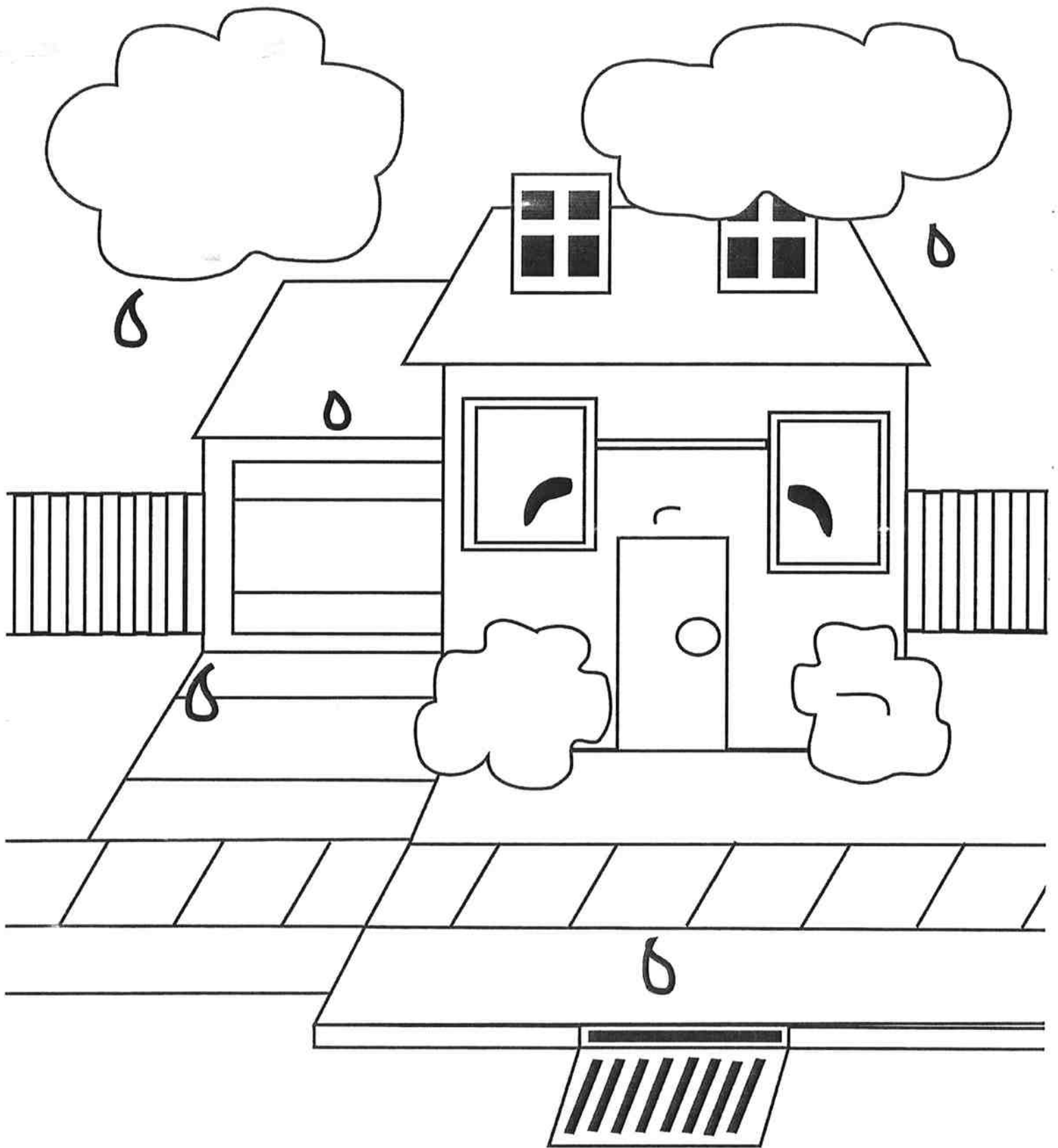


activity book

# What is storm water?



Rain water not absorbed by the ground is called storm water.



Whenever it rains water runs off rooftops, sidewalks, parking lots, and streets and travels to the storm drain system.

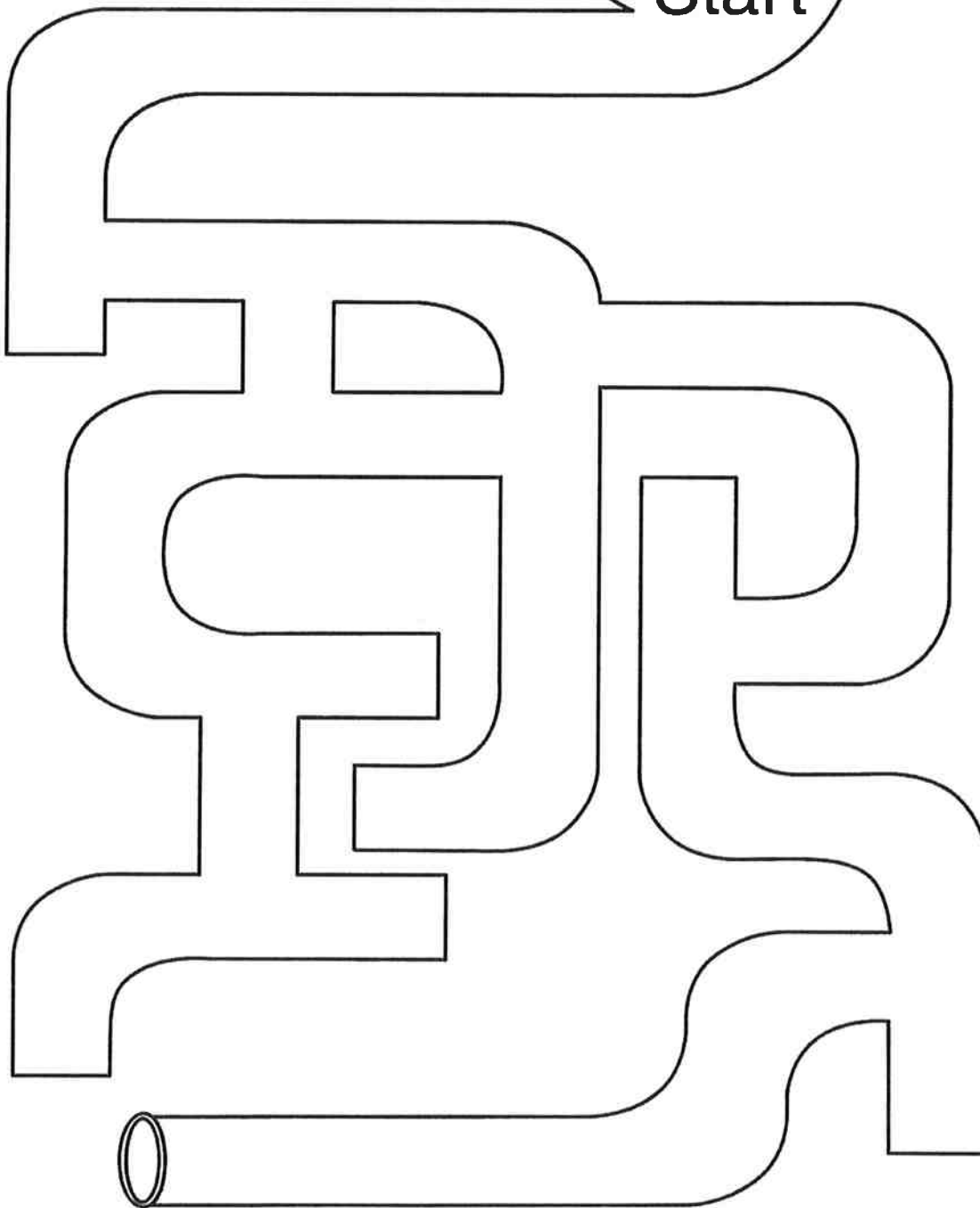
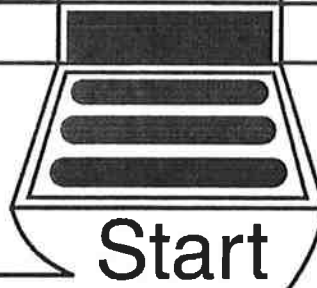


Find all 10 words.

rain river  
stream sewer  
water pollution  
street chemicals  
drain toxic

The water that flows into the storm drain runs directly to the river, which means the water remains untreated.

Help the storm water  
find its way to the river.

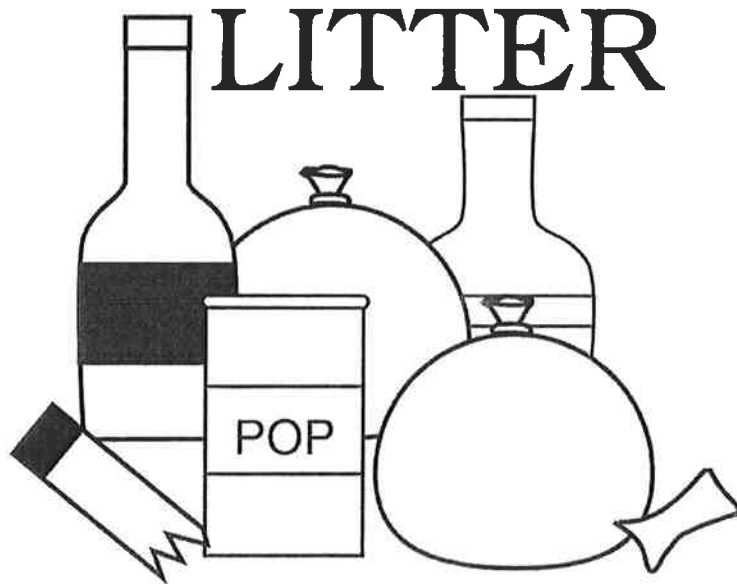


WANTED

TRASH

&

LITTER



**REWARD**

HEALTHY WATER

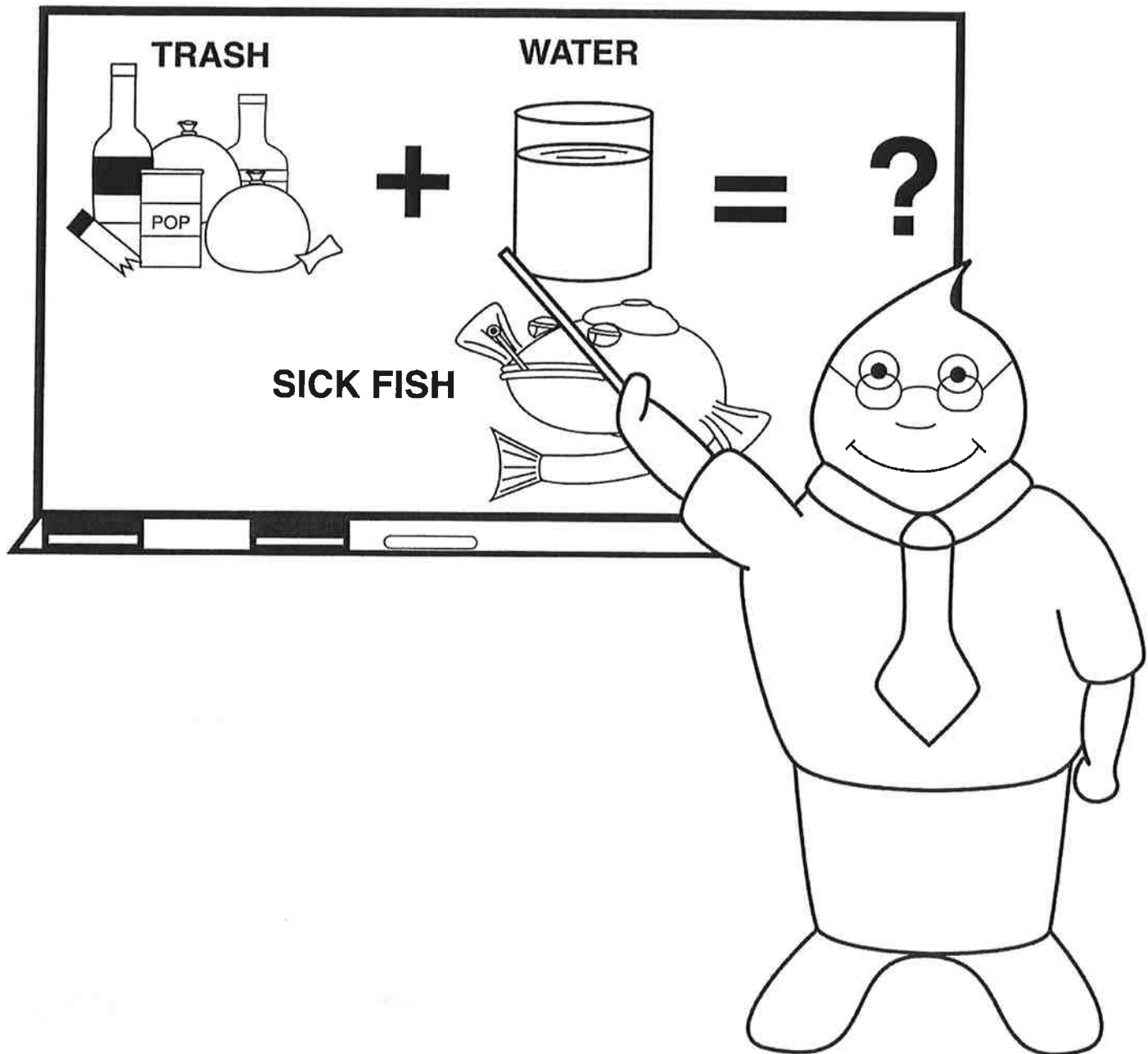
# Would you drink this water?



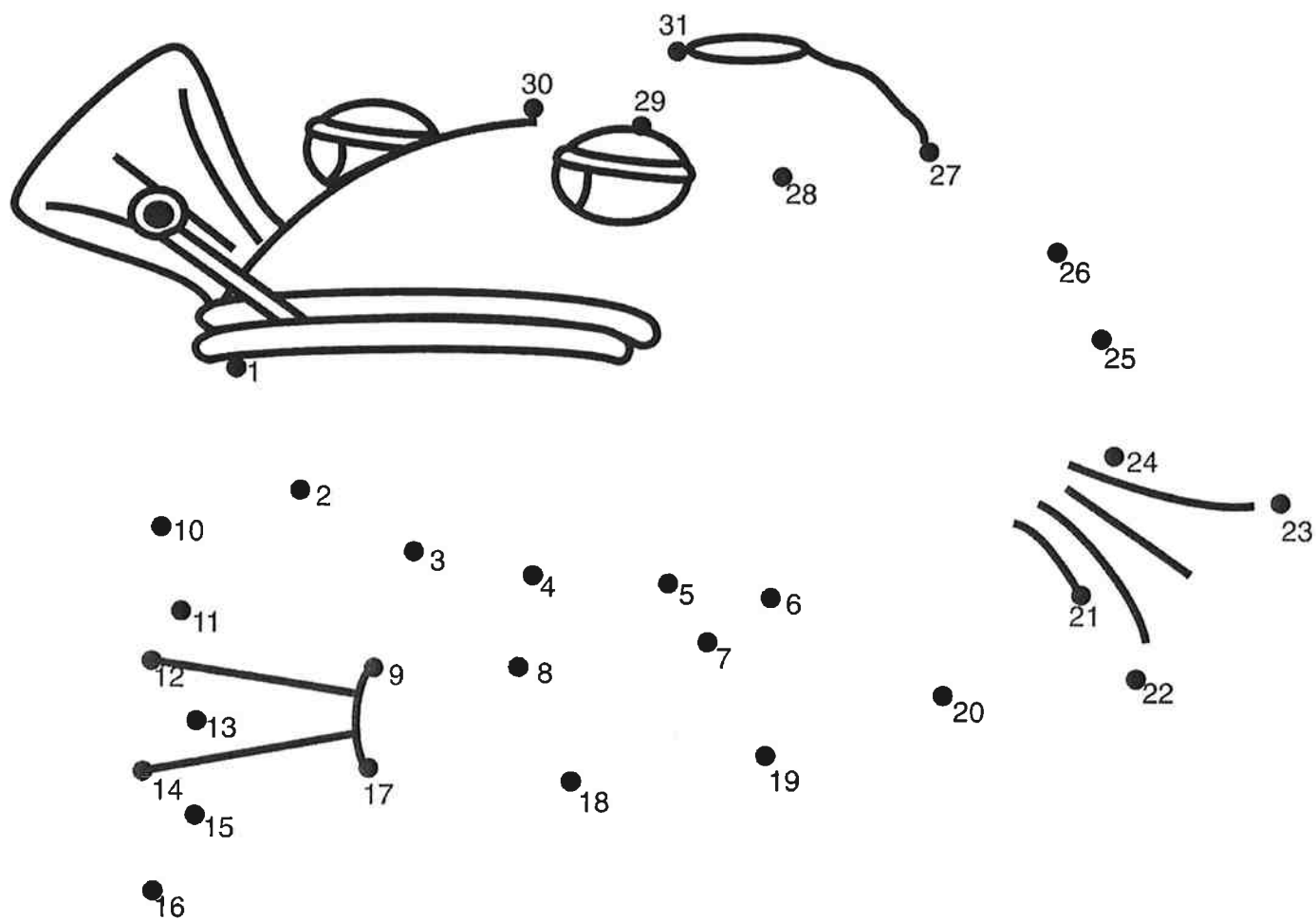
## Be Creative!

Finish drawing the glass of untreated water.

# MATH CLASS



# Dot - to - Dot

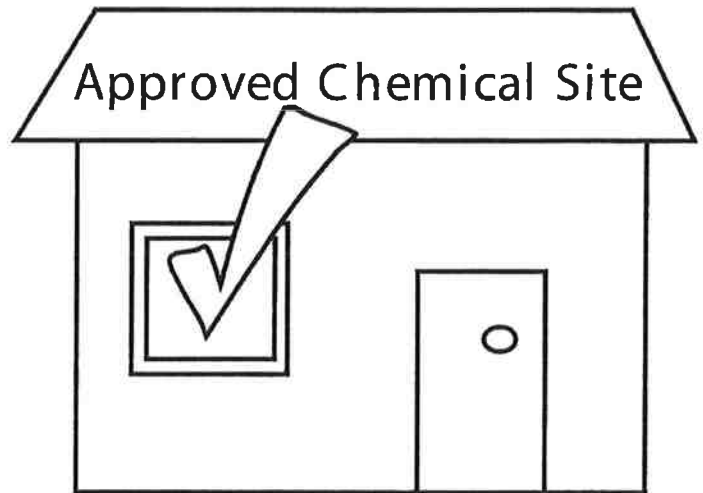


# What can I do?

**Don't** pour chemicals down the drain.



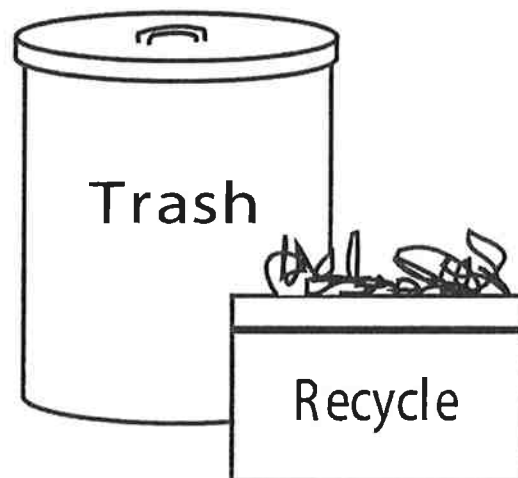
**Do** take chemicals to an approved site.



**Don't** put anything in a storm drain.



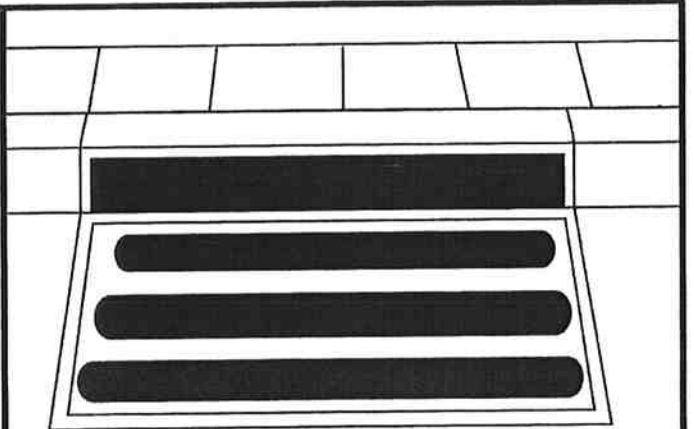
**Do** put trash in its place.



# Word Scramble



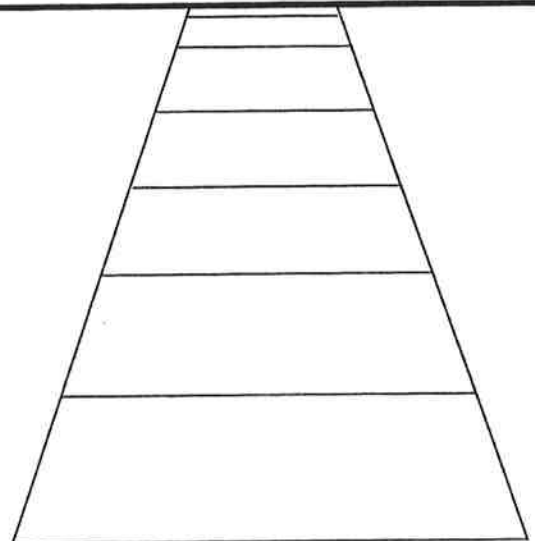
ltpoluion



tsrom rdnai



sromt aertw



wsiedakls

Brought to you by the  
**Allen County Partnership for Water Quality**



3718 New Vision Drive  
Fort Wayne, IN 46845  
(260) 484-5848 ext. 111

# **Nine Minimum Controls – No. 8**

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## **EXHIBIT H-2**

# CSO Public Notification Procedure

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# CITY OF FORT WAYNE

GRAHAM RICHARDS, MAYOR

November 7, 2003

Bruno Pigott, Branch Chief  
Permits Branch, Office of Water Quality  
Indiana Department of Environmental Management  
100 N. Senate Avenue  
P.O. Box 6015  
Indianapolis, IN 46205-6015

**Re: City of Fort Wayne's CSO Public Notification Procedure**

Dear Bruno,

Enclosed is a copy of the City of Fort Wayne's CSO Public Notification Procedure as required by 327 IAC 5-2.1-1. The City has crafted a notification procedure that blends a variety of our existing programs with new, innovative methods of keeping the citizens of Fort Wayne and Allen County informed about the potential health impacts associated with CSO discharges.

If you have any questions, please feel free to call me at (260) 427-1381.

Sincerely,

Greg Meszaros  
Director, City Utilities & Public Works

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## Combined Sewer Overflow (CSO) Public Notification Procedure City of Fort Wayne, Indiana

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### Summary of the CSO Public Notification Rule 327 IAC 5-2.1-1

327 IAC 5-2.1-1 requires Combined Sewer Overflow (CSO) communities, such as the City of Fort Wayne, to inform its citizens of the potential health impacts associated with a CSO discharge. Fort Wayne is required to promote and accomplish the following:

- (1) Educate the public, in general, and those persons who may come into contact with water that may be affected by a CSO discharge as to the possible health implications from CSO discharge tainted water.
- (2) Alert members of the public who may be immediately affected by a CSO discharge or the potential for a CSO discharge to occur.
- (3) Enable members of the public to protect themselves from possible exposure to waterborne pathogens that may result from contact with or ingestion of water from a waterway that is potentially affected by a CSO discharge.
- (4) Complement the CSO discharge requirements contained in the city's National Pollutant Discharge Elimination System (NPDES) permit, but not obviate or supersede any more stringent requirements contained in the city's NPDES permit.

### Determining CSO Events

Fort Wayne's Department of Water Pollution Control Maintenance (WPCM) will be responsible for determining whether a discharge of combined sewage from a CSO (a "CSO event") is occurring or imminent. In the event that WPCM determines a CSO event is occurring or is imminent, WPCM staff shall take the necessary actions to notify individuals and entities who have requested notification. CSO events will be determined by:

- Performing periodic visual examinations of CSO outfalls
- Monitoring local forecasts and available real-time precipitation data
- Monitoring the release of water from the City's CSO storage ponds

Fort Wayne's engineering staff have determined that a CSO event can occur as a result of one-tenth (.10) of an inch of rain. In order to determine precipitation amounts, WPCM staff shall monitor local weather forecasts to determine the potential for rainfall and/or snowmelt conditions that are likely to trigger a CSO event. In addition, staff will monitor real-time precipitation data from various weather centers such as the American Weather Services (AWS) Weatherbug program, which provides real-time precipitation data from the Fort Wayne International Airport and Holland Elementary School, and the weather center website maintained by Indiana University-Purdue University at Fort Wayne. If any of these on-line sources reveal precipitation amounts equal to or greater than one-tenth (.10) of an inch of rain, the necessary steps to notify requesting individuals and entities shall be taken.

In addition, WPCM staff, working with treatment plant staff, will monitor the release of water from the wastewater plant's CSO storage ponds. Release of water from these ponds that exceeds permit requirements shall trigger the CSO notification process.

## Fort Wayne's CSO Public Notification Procedure

1. In March of each year, the City of Fort Wayne shall submit a "Media Release" to the *News-Sentinel* and the *Journal Gazette* detailing the steps an individual must take to receive direct notification of a current or probable CSO discharge. Those individuals or entities that request notification shall receive an e-mail and/or a telephone message, according to their preference, when a CSO discharge is occurring or is imminent. Attachment A includes the media release to be submitted annually for publication in March.

### Media Contact Information

#### The Journal Gazette

600 W. Main St.  
Fort Wayne, IN 46801-0088  
(260) 461-8428 (telephone)  
(261) 461-8648 (fax)

#### The News Sentinel

600 W. Main St.  
Fort Wayne, IN 46802  
(260) 461-8239 (telephone)  
(260) 461-8817 (fax)

2. The Fort Wayne-Allen County Department of Health will, as required by 327 IAC 5-2.1-1, be notified of all current or potential CSO discharges. The City staff will contact the Department of Health in January of 2004 to identify the Department of Health's point of contact and his or her preferred method of notification (e-mail and/or telephone).
3. The City of Fort Wayne, City of New Haven, and Allen County created the Allen County Partnership for Water Quality (ACPWQ) to better educate the public about water resource issues. Together, these entities have funded a Water Resources Education Specialist position. The Education Specialist, in addition to other responsibilities, will help promote awareness of the City's CSO Public Notification Procedure. Through newsletters, brochures, and public presentations, the Education Specialist will educate residents on the City's CSO program and how individuals may subscribe for notification of CSO discharges.
4. Those individuals and entities that request notification via the automated e-mail service shall receive an electronic text message for all likely or occurring CSO discharges. Attachment B includes a copy of the text message to be sent to requesting individuals and entities. The e-mail system will be operational by January of 2004.
5. Those individuals and entities who request notification via the telephone messaging service shall receive a voice message for all likely or occurring CSO discharges. Attachment C includes the script of the telephone message to be sent to requesting individuals and entities. In the event the interest in the telephone service is larger than anticipated, the City may opt to utilize an automated telephone messaging system.
6. The City of Fort Wayne currently posts and maintains signage at all CSO outfalls with language consistent with 327 IAC 5-2.1-1. Attachment D identifies the location of CSO outfalls within the City of Fort Wayne. Attachment E provides an example of the new CSO outfall signage that will be installed when repair or replacement of existing signage is necessary.

7. The City of Fort Wayne will post additional CSO signage at the following public locations within the City's municipal jurisdiction:

- At public access points to waters potentially affected by CSO discharges, including boat ramps, bridges, parks, fishing spots, and school yards.
- Along parkways and greenways on or adjacent to potentially affected waters at locations most likely to provide public access.

Attachment F identifies those stream segments determined to be "affected waters" as a result of the City's CSO discharges. Attachment G identifies those areas (bridges, boat ramps, fishing spots, greenways, parks, school yards, etc.) identified by Fort Wayne's Sewer Advisory Group (SAG) that may provide direct public access to the affected waters. The City will examine the points identified in Attachment F and determine which sites warrant CSO signage. Attachment H provides an example of the general CSO signage to be erected as a result of this procedure. Any additional sites identified by the City or through other means will be examined and, if warranted, CSO signage will be erected.

8. City of Fort Wayne staff will work closely with the City of New Haven, a downstream CSO community, to identify public and private property owners outside of both Fort Wayne's and New Haven's jurisdictions that provide public access to the CSO affected waters. Annually, in March, with cooperation from the City of New Haven, City staff shall contact, via the U.S. mail, all known public and private property owners which provide public access to the CSO affected waters outside of both City's municipal jurisdictions and offer to provide free CSO signage.
9. The City of Fort Wayne operates and maintains a website ([www.cityoffortwayne.org/new/water/where\\_cso.htm](http://www.cityoffortwayne.org/new/water/where_cso.htm)) and a CSO hotline (260-427-2297), both of which contain valuable CSO information. The City's website and CSO hotline will be updated to include information on the CSO Public Notification Procedure and the proper steps individuals can take to become notified of a CSO event. The website address and the CSO Hotline number will be advertised annually in the March press release advertising notification opportunities.
10. Annually, in March, City staff will directly contact numerous local media outlets (television and radio) and offer to provide CSO notification through the method of each media outlet's preference (e-mail and/or telephone).
11. Annually, in March, City staff will directly contact local advocacy groups and offer to provide CSO notification through the method of each group's preference (e-mail and/or telephone). Such groups include but are not limited to: Isaac Walton League, the Sewer Advisory Group, and the River Greenway Consortium.

#### Monthly Record Keeping and Reporting

A CSO Public Notification Log will be developed by and maintained at the Department of Water Pollution Control Maintenance. WPCM will be responsible for recording all monthly activities associated with Fort Wayne's CSO Public Notification Procedure, including:

- Locations of all CSO signage (jurisdictional and non-jurisdictional)
- Dates all CSO signs are erected

- Dates of all CSO notifications and the warranting events
- Dates of any CSO events for which CSO notification was not given
- Contact list of all who currently request CSO notification
- Names and addresses of all public and private property owners that provide public access to affected streams and the date letters were sent advertising the availability of CSO signage.

The CSO Public Notification Log will be summarized on an annual basis and made available for public review at the Department of Water Pollution Control Maintenance. The City's CSO Public Notification Procedure will be evaluated annually by the Fort Wayne Sewer Advisory Group (SAG). Any modification to the City's CSO Public Notification Procedure will be posted in the *Journal Gazette* and the *News Sentinel*.

ATTACHMENT A  
MEDIA RELEASE

**For Release:** Monday, February 9, 2004

**Contact:** John Perlich, Public Information, 427-6957

## **City Begins CSO Public Notification Plan**

*Fort Wayne, Ind.* – The City of Fort Wayne has implemented its combined sewer overflow (CSO) public notification plan.

The Indiana Department of Environmental Management (IDEM) now requires communities with combined sewers to notify the public when a CSO is occurring or imminent. The City of Fort Wayne is one of 105 CSO communities in Indiana.

Individuals interested in knowing when a CSO is occurring or imminent, can find out via e-mail or telephone. A free e-mail subscription is available by signing up at [www.cityoffortwayne.org/cso\\_list.asp](http://www.cityoffortwayne.org/cso_list.asp). Information over the telephone can be obtained by calling the City's Water Pollution Control Maintenance Department, 427-1255. Additional CSO information is available at [www.cityoffortwayne.org/new/water/where\\_cso.htm](http://www.cityoffortwayne.org/new/water/where_cso.htm) and the CSO Hotline, 427-2297.

A CSO event results in the discharge of untreated stormwater and sewage into the St. Joseph, St. Marys and Maumee rivers. It is strongly recommended that the public avoid direct contact with the following stream segments for a 72-hour period following a CSO discharge.

- *St. Joseph River from Coliseum Boulevard to the confluence of the Maumee River*
- *St. Marys River from Airport Expressway to the confluence of the Maumee River*
- *Maumee River from the confluence of the St. Joseph River and the St. Marys River through the city of New Haven to the Platter Road bridge over the Maumee River in Milan Township*

###

ATTACHMENT B  
E-MAIL NOTIFICATION

**\*\*\*COMBINED SEWER OVERFLOW WARNING TODAY\*\*\***

When it rains, the 100-year-old combined sewers in Fort Wayne can overflow resulting in the discharge of an untreated combination of stormwater (rain or snowmelt) and sewage into our waterways. Today's forecast indicates a strong possibility that overflows will occur or have occurred in the past 24 hours.

Individuals should avoid direct contact with water in any of the CSO affected waterways described below. Consumption of or direct contact with sewage-contaminated water could make you sick. Signs are posted along our waterways to identify the City's combined sewer outfalls and areas where contact with water could be hazardous to your health.

The affected CSO waterways include:

- St. Joseph River from Coliseum Boulevard to the confluence of the Maumee River
- St. Marys River from Airport Expressway to the confluence of the Maumee River
- Maumee River from the confluence of the St. Joseph River and the St. Marys River through the city of New Haven to the Platter Road bridge over the Maumee River in Milan Township

The City of Fort Wayne encourages the public to take the following protective actions when recreating in City streams:

- Avoid direct contact with CSO streams during and for three days (72 hours) after a rain event.
- Alter recreational activities in order to avoid direct water contact.
- If contact does occur with CSO streams, wash your hands immediately, especially prior to eating.
- Use a waterless hand sanitizer at outings that occur near CSO streams.

Clean water is a priority for the City of Fort Wayne. The City is implementing a variety of projects to improve our waterways and reduce and eliminate CSO discharges. The long-term costs to control CSOs in Fort Wayne will likely exceed \$250 million over the next 15 to 20 years.

You have received this e-mail because you previously subscribed to this e-mail distribution list or someone on the subscribed list forwarded this message to you.

If this message was forwarded to you and you would like to subscribe, click on the following link: [www.cityoffortwayne.org/cso\\_list.asp](http://www.cityoffortwayne.org/cso_list.asp)

If you previously subscribed but no longer wish to receive this e-mail message, click on the following to unsubscribe: [listserv@ci.ft-wayne.in.us](mailto:listserv@ci.ft-wayne.in.us)

If you would like to learn more about Fort Wayne's CSO program, click on the following link: [www.cityoffortwayne.org/new/water/where\\_cso.htm](http://www.cityoffortwayne.org/new/water/where_cso.htm) or call Fort Wayne's CSO Hotline at 260-427-2297.

**Attachment C**  
**Automated Telephone Notification**

*"This is a message from the Fort Wayne's Water Pollution Control Maintenance Department...*

*Today, weather conditions indicate a strong possibility that CSO overflows will occur, or that overflows have occurred in the past 24-hours.*

*Please avoid all contact with water in any of the CSO affected waterways described later in this message. Consumption of or direct contact with sewage-contaminated water could cause sickness.*

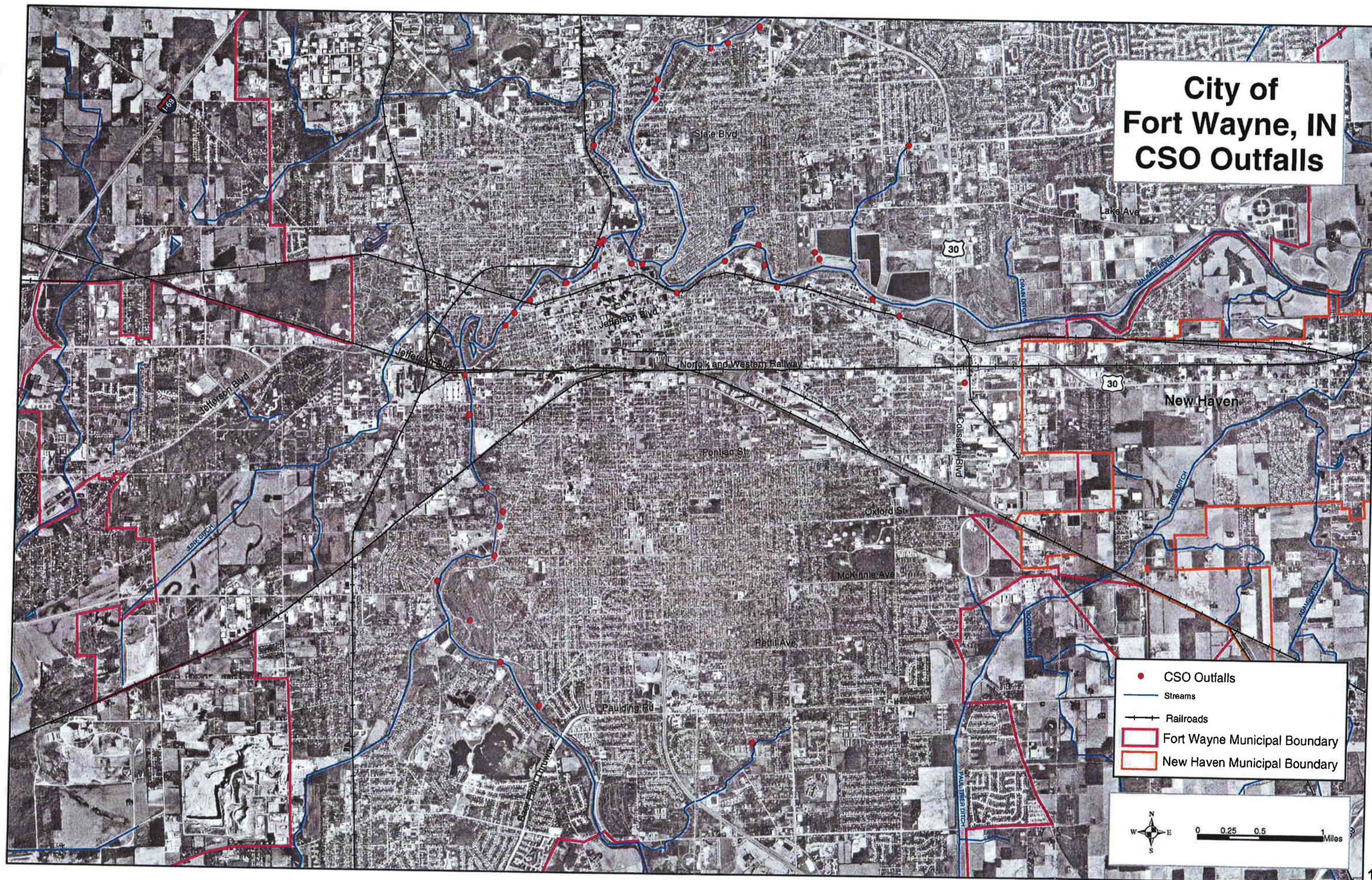
*The CSO affected waterways include:*

- *St. Joseph River from Coliseum Boulevard to the confluence of the Maumee River*
- *St. Mary's River from Airport Expressway to the confluence of the Maumee River*
- *Maumee River from the confluence of the St. Joseph River and the St. Mary's River through the Town of New Haven to the Platter Road bridge over the Maumee River in Milan Township.*

*For additional information, please call Fort Wayne's CSO Hotline at (260) 427-2297 or Water Pollution Control Maintenance at (260) 427-1255.*

Attachment D  
CSO Outfall Locations

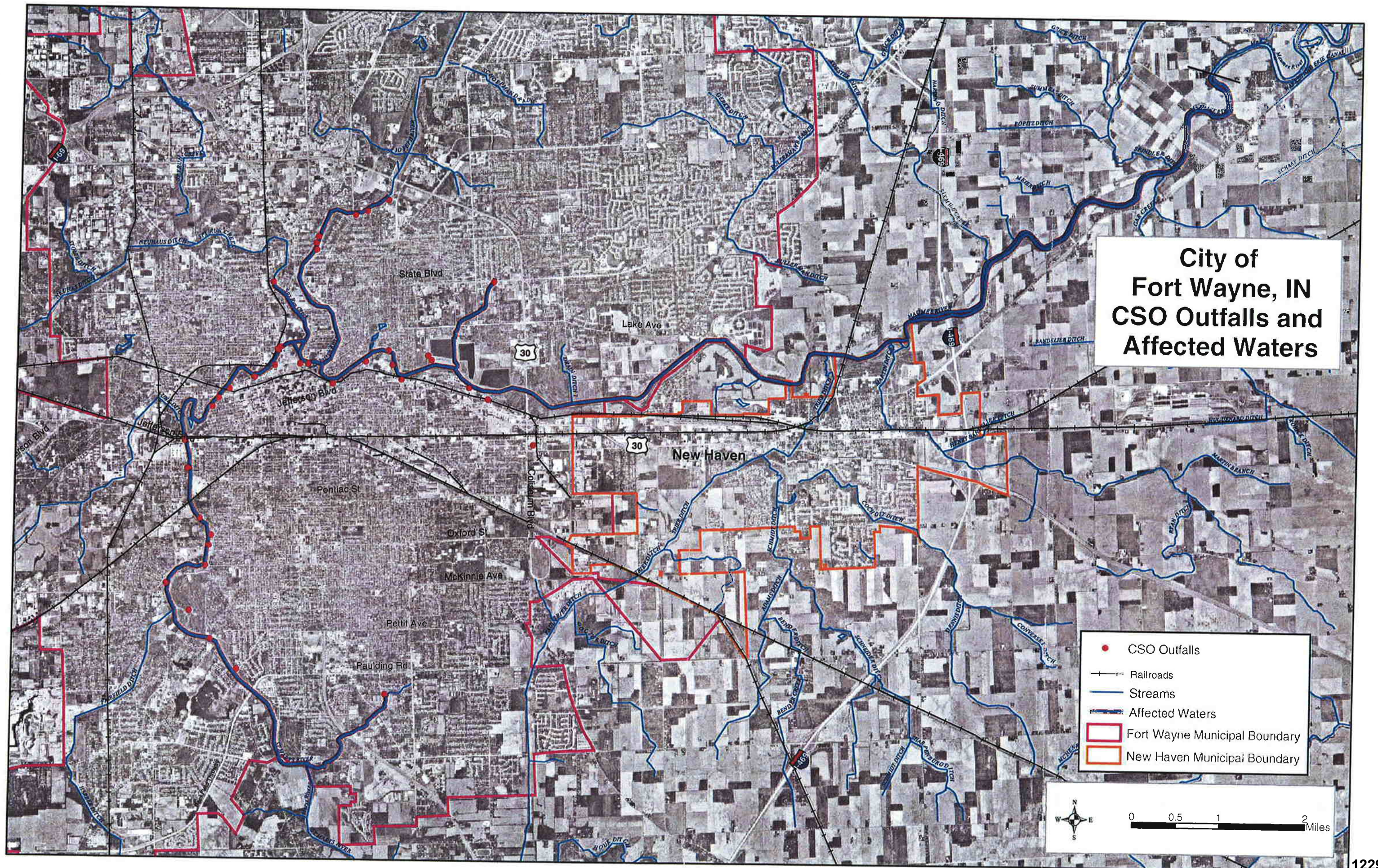
# City of Fort Wayne, IN CSO Outfalls



**Attachment E**  
**CSO Outfall Signage**

CAUTION. This is a Combined Sewer Overflow [CSO] Outfall. Water coming from this pipe is polluted. Consumption of or contact with wastewater from this pipe may cause sickness. Discharges should occur only during or after rain events or snow melts. In the event of discharges during dry weather or for more information, please call 427-1255. For recorded river quality information please call: (260) 427-2297  
CSO OUTFALL #

Attachment F  
CSO Affected Streams



Attachment G  
Public Access Points

# City of Fort Wayne, IN Affected Waters

Park/Golf Course Name	Number
Bloomingdale Park East & West	4
Camp Allen Park	13
East Central Park	18
East Swinney Park	20
Fairview Golf Course	1
Foster Park/Foster West	22
Griswold Drive Playlot	26
Guidlin Park	27
Hanna's Ford	30
Headwaters Park	31
Indian Village (Sears) Park	32
Johnny Appleseed Park	36
Kreager Park	41
Lakeside Golf Club	K
Lakeside Park	43
Lawton Park	44
Little Turtle Memorial	47
Maumee Valley Golf Club	L
Old Fort Park/Historic Old Fort	58
Orff Park	59
Roosevelt Park	65
Rudisil/Fairfield Park	66
Tillman Park	73
Traders Point (Rivergreenway)	74
West Swinney Park	83

CSO Outfalls

Schools on or adjacent to Affected Waters

Fort Wayne Public Access Points

Public Parks and Facilities on Affected Waters

Private Golf Courses on Affected Waters

Fort Wayne Municipal Boundary

New Haven Municipal Boundary

Streams

Affected Waters

N

E

S

W

0

0.5

1

2

Miles

Attachment H  
Affected Waters Signage

**CAUTION.** Wastewater or sewage from CSOs may be in this waterway during and for several days after periods of rainfall or snowmelt. People who swim in, wade in, or ingest this water may get sick.

For more information, please call the  
CSO Hotline at (260) 427-2297 or  
the Department of Water Pollution  
Control Maintenance at (260) 427-1255



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Governor

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Commissioner

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Indianapolis, Indiana 46206-6015  
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(800) 451-6027  
[www.IN.gov/idem](http://www.IN.gov/idem)

June 10, 2004

The Honorable Graham Richard, Mayor  
City of Fort Wayne  
1 Main Street #900  
Fort Wayne, Indiana 46802

RE: CSO Public Notification Plan  
Fort Wayne, Indiana  
Allen County

Dear Mayor Richard:

The Indiana Department of Environmental Management (IDEM) acknowledges receipt of your letter dated June 9, 2004, regarding the City of Fort Wayne's Combined Sewer Overflow Public Notification Plan. The Plan is a requirement of 327 IAC 5-2.1-(1-6). The information shall be incorporated into Fort Wayne's Combined Sewer Overflow Operational Plan (CSOOP) and immediately implemented. No further action is needed from the City of Fort Wayne at this point.

If you have any questions regarding this Combined Sewer Overflow Public Notification Plan, please contact H.T. Pham, of my staff at 317-233-8770.

Sincerely,

Cynthia Wagner, Chief  
Wet Weather Section  
Office of water Quality

Cc: Mr. Rick Roudebush, OWQ Inspection  
Mr. Don Daily, OWQ Compliance  
Mr. H.T. Pham, OWQ Wet Weather Section  
Mr. Greg Meszaros, Director, City Utilities and Public Works  
File Room

Mary Jane Slator



# CITY OF FORT WAYNE

GRAHAM RICHARD, MAYOR

June 9, 2004

Cynthia Wagner, Chief  
Wet Weather Section, Office of Water Quality  
Indiana Department of Environmental Management  
100 N. Senate Avenue  
P.O. Box 6015  
Indianapolis, Indiana 46205-6015

**RE: City of Fort Wayne's CSO Public Notification Procedure  
Completeness Review Response to Review Comments**

Dear Ms. Wagner:

Thank you for your letter dated May 20, 2004 concerning your office's review of the CSO Public Notification Procedure ("PNP") submitted by the City of Fort Wayne (the "City") to IDEM last fall. We have completed our review of the eight questions submitted by your letter and are please to both provide the responses shown below and hereby amend the PNP to include each fo the same.

**IDEM Comment 1:** The local schools were not identified in the PNP. Please clarify whether any schools are located in this area. If so, please describe how you propose to provide notification to them.

**City Response:** There are schools located in the CSO affected area as shown on Attachment G of the PNP as originally submitted. Letters offering individual CSO notification via e-mail or telephone will be sent to the corporation offices of those school systems. CSO signage will be offered to individual schools or to their corporation offices. These institutions will be notified of CSO events by e-mail or telephone if they respond to the above referenced offer. Further, any person or entity may request and receive notification through the City's website or by responding to the City's annual newspaper notice.

**IDEM Comment 2:** The local owners or operators of public drinking water systems within ten (10) river miles of CSO outfalls were not identified in the PNP. Please clarify whether any owners or operators are located in this area. If so, please describe how you propose to provide notification to them.

**City Response:** There are no public drinking water systems with surface water intakes within ten (10) river miles of Ft. Wayne's CSO outfalls.

**IDEM Comment 3:** The local owners or operators of facilities that provide access to, or recreational opportunities in or on affected waters were not identified in the PNP. Please clarify

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whether any owners or operators are located in this area. If so, please describe how you propose to provide notification to them.

**City Response:** As outlined in Item 7 in the submitted PNP, additional CSO signage will be posted at public access points to waters potentially affected by CSO discharges including boat ramps, bridges, parks, fishing spots and school yards. In addition, local owners and operators of private facilities that provide access to, or recreational opportunities on affected waters within the City's political boundaries, for example private golf courses, will receive letters offering them CSO signage. The City understands that such private entities downstream of the City that are in the City of New Haven and before the Platter Road bridge will be offered signage by the City of New Haven. Further, any person or entity may request and receive e-mail or telephone notification through the City's website at any time, or by responding to the City's annual newspaper notice.

**IDEM Comment 4:** The local residents on or adjacent to the affected waters were not identified by the PNP. Please clarify whether any residents are located in this area. If so, please describe how you propose to provide notification to them.

**City Response:** There are residents located on or adjacent to affected waters. They will be provided notification by e-mail alert or telephone if they request notification through the City's website or by responding to the City's annual newspaper notice.

**IDEM Comment 5:** Please clarify whether a detailed assignment of responsibilities within the community for implementing the procedure is given.

**City Response:** The responsibility for implementing the PNP has been given to the City's Department of Water Pollution Control Maintenance as indicated in the "Monthly Record Keeping and Reporting" section on Pages 3 and 4 of the submitted PNP.

**IDEM Comment 6:** The PNP does not mention if the chosen notification procedure is mutually agreeable to the recipient and the CSO community. Please describe how the plan was/will be presented to the public.

**City Response:** The PNP was presented to and approved by the City's citizen-comprised Sewer Advisory Group (SAG) in its public meeting of October 1, 2003. The meeting, as well as the intent of the meeting, was publicized in local newspapers.

**IDEM Comment 7:** The Fort Wayne PNP does not identify where signs in English or any other language will be located, whether a public notice (e-mail or phone contact) will be made in English or any other language if necessary and whether the annual notice will be made in English or any other language. Please clarify these issues and include appropriate documentation.

Cynthia Wagner, Chief

June 9, 2004

-3-

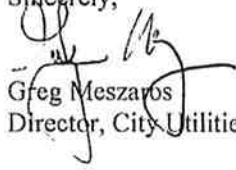
**City Response:** Signage and annual notification will be given in English only. If it is determined in the future that an additional language is necessary, the City will modify its PNP accordingly. The locations at which CSO signage will be erected are discussed in Item 7 of the PNP and are identified in Appendix G.

IDEM Comment 8: Documentation has not been included that his plan has been/will be included in your Combined Sewer Overflow Operation Plan (CSOOP). Please clarify this issue and include appropriate documentation.

**City Response:** The finally approved PNP will be incorporated into the CSOOP. As you are aware, a schedule for completion of an approved CSOOP is currently being discussed by the City and IDEM.

If you need additional information, please contact me at (260) 427-1381.

Sincerely,

  
Greg Meszaros  
Director, City Utilities and Public Works

cc: Mr. Rick Roudebush, OWQ Inspections  
Mr. Don Daily, OWQ Compliance  
Mr. H.T. Pham, OWQ, Wet Weather Section  
file

## Fort Wayne CSO Public Notification Plan Requirements

Item No.	When	Action	Responsible Party
1 & 9	Annually in March	News Release to the Journal Gazette, News Sentinel and other media outlets detailing the steps that citizens should take to receive CSO Notification. This release must also include information about the CSO Hotline and the information/notification procedure on the City's website.	City Utilities PIO
2	When events warrant	Notification sent via e-mail to persons/parties that have requested	CSO Program Manager
3	As opportunities are available	Promote awareness of the City's CSO public notification procedure through newsletters, brochures and public presentations	Water Quality Education Specialist
4	When events warrant	Individuals and entities that have requested notice will be notified by e-mail of CSO events	CSO Program Manager
5	NA	Phone notification	NA
6	When repair or replacement is necessary	Signage to be located at CSO outfalls	CSO Program Manager
7	As sites are identified	Signage to be posted at public access points, along parkways and greenways and at locations most likely to provide public access	CSO Program Manager
8	Annually in March	Notify public and private property owners who provide public access to CSO affected waters that free signage is available. Also notify schools on CSO affected waters (see Revision 1 & 3 below).	City Utilities PIO

10	Annually in March	Contact area media outlets and offer to provide CSO Notification to them in a method of their preference.	City Utilities P/O
11	Annually in March	Send letter to local advocacy groups offering to provide notification via the method of that group's choosing.	City Utilities P/O
Revision 1	Annually in March	Send letters to school corporation offices offering CSO notification	City Utilities P/O
Revision 3	See item 8	Private owners of recreational facilities that provide access to or recreational opportunities on CSO affected waters to be offered signage and notification.	City Utilities P/O

## **Annual Report**

### **Fort Wayne CSO Education and Public Notification Program**

#### **CSO Education Program**

##### **2004 Activities**

##### **Education Program Changes in 2004**

#### **CSO Public Notification Program**

##### **2004 Notification Log**

The attached logs show the following for 2004:

- Locations of all CSO signage
- Dates when each sign was erected
- Dates of CSO notifications and the events that caused the notification to be issued
- Dates of an documented CSO events for which notification was not given
- Contact list of all who are currently on the list to receive notification
- Names and addresses of all public and private property owners who provide public access to affected streams and the date when letters were sent notifying them of the availability of free CSO signage

##### **Notification Program Changes in 2004**

City of Fort Wayne CSO Sign Locations

<u>Outfall SIP #</u>	<u>Location</u>	<u>Receiving Water</u>	<u>Date of Installation</u>
Unknown	Plant Outfall from Pond #3	Maumee River	
Unknown	Plant Outfall	Maumee River	
Unknown	Terminal Pond #2	Maumee River	
J03-313	Brown Street Pump Station	St Marys River	
J02-090	100' E. of Rolling Mills Regulator	St Marys River	
J11-164	25' E. of Indian Village Regulator	St. Marys River	
J11-222	25' E. of Indian Village Regulator	St. Marys River	
K03-092	90' E. of Brown Street Pump Station	St. Marys River	
<b>K03-311</b>	<b>Abandoned</b>		
<b>K06-152</b>	<b>Abandoned</b>		
<b>K06-230</b>	<b>Abandoned</b>		
K06-233	50' E. of Nebraska Pump Station	St. Marys River	
K06-234	25' S.E. of Nebraska Pump Station	St. Marys River	
K06-298	80' W. of Thieme Dr. & W. Berry St.	St. Marys River	
K07-106	25' W. of Dinnen & Packard Av.	St. Marys River	
<b>K07-108</b>	<b>Abandoned</b>		
K07-109	W. of 3418 Broadway	St. Marys River	
K07-176	W. end of alley btw Wildwood & Waldron Cir.	St. Marys River	
K11-165	W. of Rudisill & Broadway	St. Marys River	
K11-178	W. of Rudisill & Broadway	St. Marys River	
K15-116	4610 Hartman Rd.	St. Marys River	
K19-044	660' W. of Old Mill & Fairfax	St. Marys River	
<b>K19-076</b>	<b>Abandoned</b>		
K19-077	100' E. of Hartman Rd. S. of ball diamonds	St. Marys River	
<b>L06-099</b>	<b>Abandoned</b>		
L06-103	100' N.E. of Jackson & Superior	St. Marys River	
L06-420	220' N.W. of Superior & Fairfield	St. Marys River	
L06-421	220' N.W. of Superior & Fairfield	St. Marys River	
M10-151	Third Street Pump Station	St. Marys River	
M10-202	Third Street Pump Station	St. Marys River	
M10-238	80' S. of Griswald Pump Station	St. Marys River	
M10-265	230' E. of Duck & Barr Sts.	St. Marys River	
<b>M10-270</b>	<b>Abandoned</b>		
<b>M10-273</b>	<b>Abandoned</b>		
M10-306	120' N. of Clair & Harrison	St. Marys River	
M10-313	Third Street Pump Station	St. Marys River	
<b>M14-254</b>	<b>Abandoned</b>		
M18-032	520' N. of State & Westbrook	Spy Run Creek	
<b>M18-166</b>	<b>Abandoned</b>		
<b>M18-167</b>	<b>Abandoned (storm water only)</b>		
N06-022	122' N. of Hanna & Berry Sts.	St. Joseph River	
<b>N10-106</b>	<b>Abandoned</b>		
<b>N14-274</b>	<b>Abandoned</b>		
N18-254	100' W. of Northside Dr. & Glazier Dr.	St. Joseph River	
<b>N18-034</b>	<b>Abandoned</b>		
<b>N18-043</b>	<b>Abandoned</b>		
N22-093	130' E. of Dalgren & Spy Run Av.	St. Joseph River	

N22-103	100' E. of Penn & Spy Run Av.	St. Joseph River
O10-097	Morton Street Pump Station	Maumee River
O10-252	Morton Street Pump Station	Maumee River
O10-257	300' S. at end of Griffen St.	Maumee River
O10-277	100' N. of Coomb & Herbert Sts.	Maumee River
O22-002	120' N.W. of St Joe River Dr. & Woodrow	St. Joseph River
O22-004	370' W. of N. Anthony & St. Joe River Dr.	St. Joseph River
O22-094	200" E. of Pamell Av. Bridge	St. Joseph River
O23-080	240' E. of Mercer Av. & Hollis Ln.	Natural Drain #4
P06-192	Under Anthony St. Bridge S. bank	Maumee River
P10-025	W. side of Pond #1, Stormwater Treatment Plant	Maumee River
P10-121	Stormwater Lift Station wet well	Maumee River
Q06-034	390' N.W. of Edsall & Dwenger Av.	Maumee River
<b>Q06-099</b>	<b>Abandoned</b>	
R06-031	670' N.E. of Greenwalt & Maumee Av.	Maumee River
R14-137	200' W. of Laveme Av. & State St.	Baldwin Ditch
R14-138	200' W. of Laveme Av. & State St.	Baldwin Ditch
<b>R19-078</b>	<b>Abandoned (storm water only)</b>	
S02-035	Harvester Ditch N. of Gladieux Refinery	Harvester Ditch

**APPENDIX 7**  
**Annual Report of Education and**  
**Public Notification Program**

## Fort Wayne CSO Notification Log

	Date of Notification	Warranting Event
--	----------------------	------------------

### **January**

dates of CSO events in January for which notice was not given

### **February**

dates of CSO events in February for which notice was not given

### **March**

dates of CSO events in March for which notice was not given

### **April**

dates of CSO events in April for which notice was not given

### **May**

dates of CSO events in May for which notice was not given

### **June**

dates of CSO events in June for which notice was not given

### **July**

dates of CSO events in July for which notice was not given

### **August**

dates of CSO events in August for which notice was not given

**September**

dates of CSO events in September for which notice was not given

**October**

dates of CSO events in October for which notice was not given

**November**

dates of CSO events in November for which notice was not given

**December**

dates of CSO events in December for which notice was not given

### CSO Notification Contact List

Last Name	First Name	E-mail	Address
Slaton	Mary	<u>mary.jane.slaton@ci.ft-wayns.in.us</u>	

**Public & Private Property Owners Notified of Availability of Free CSO Signage**

Last Name	First Name	Address	City	State	Zip	Date Letter Was Sent
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# **Nine Minimum Controls – No. 8**

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## **EXHIBIT H-3**

# **Annual Report of Education and Public Notification Program**

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## **Annual Report Fort Wayne CSO Education and Public Notification Program**

### **CSO Education Program**

#### **2004 Activities**

#### **Education Program Changes in 2004**

### **CSO Public Notification Program**

#### **2004 Notification Log**

The attached logs show the following for 2004:

- Locations of all CSO signage
- Dates when each sign was erected
- Dates of CSO notifications and the events that caused the notification to be issued
- Dates of an documented CSO events for which notification was not given
- Contact list of all who are currently on the list to receive notification
- Names and addresses of all public and private property owners who provide public access to affected streams and the date when letters were sent notifying them of the availability of free CSO signage

#### **Notification Program Changes in 2004**

# **Nine Minimum Controls – No. 8**

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## **EXHIBIT H-4**

# List of Available Educational Material

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## Flyers

Available from Partnership for Water Quality, 3718 New Vision Drive

Combined Sewer Overflows  
Stormwater Pollution  
Household Hazardous Waste  
Septic System Maintenance  
Green Landscaping  
Stormwater Activity Book

Available from City of Fort Wayne, One East Main Street, Room 200

Biosolids Use and Reuse  
Combined Sewer Overflows  
Drinking Water Handbook  
Dealing With Flood and Sewer Waters  
Step-by-Step Downspout Disconnection Guide

# **Nine Minimum Controls – No. 8**

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## **EXHIBIT H-5**

# Contacts for Educational Activities

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## **Allen County Partnership for Water Quality**

Matt Jones, Education Specialist  
3718 New Vision Drive  
Fort Wayne, Indiana 46845

260/484-5848  
260/484-5080 (fax)  
[Matt.jones@IN.nacdnet.net](mailto:Matt.jones@IN.nacdnet.net)

## **Fort Wayne Sewer Advisory Group**

Michael Joyner, Public Information Officer  
One East Main Street, Room 280  
Fort Wayne, Indiana 46802

260/427-1381  
[michael.joyner@ci.ft-wayne.in.us](mailto:michael.joyner@ci.ft-wayne.in.us)

The Sewer Advisory Group meets bi-monthly on the first Wednesday at February, April, June, August, October and December at 6:00 at the Fort Wayne City-County Building.

## **Fort Wayne Board of Public Works**

Gina Kostoff, Manager  
One East Main Street, Room 420  
Fort Wayne, Indiana 46802

260/427-1121

The Board of Public Works meets weekly on Wednesday morning at 9:00 in the Omni Room of the Fort Wayne City-County Building. Meetings are also taped and rebroadcast on the City's Cable Access Channel. The Board of Works approves all expenditures related to the City's sewer system.

# **Nine Minimum Controls – No. 8**

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## **EXHIBIT H-6**

# Sample CSO Sign

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# **Nine Minimum Controls – No. 8**

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## **EXHIBIT H-7**

# Water Quality Hotline

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## WATER QUALITY HOTLINE

The phone number for Fort Wayne Water Quality/CSO Hotline is:

**(260) 427-2297**

This pre-recorded information service provides callers with information about conditions in receiving water. During the spring, summer and fall, the information on the Hotline is updated weekly with the results of the current week's bacteria sampling. The Hotline also includes general precautions about bodily contact with CSO affected streams during wet weather events and information about how callers can receive more timely information about wet weather events.

The following is the script for the Hotline during the recreational season (April – October) when bacteriological samples are being tested weekly:

**“Thank you for calling Fort Wayne City Utilities’ Combined Sewer Overflow Hotline.**

**This message is intended to give you information about water quality in Fort Wayne’s rivers and streams and to provide general information about the risks associated with combined sewer overflows.**

**[Insert current test results here]**

**During periods of rain or snowmelt, Fort Wayne’s 100-year old combined sewers can overflow, resulting in the discharge of an untreated combination of stormwater and sewage into our waterways.**

**Fort Wayne’s three rivers as well as the downstream portion of the Spy Run Creek and the Baldwin Drain and Wayne Natural Drain Number 4 are affected by CSO discharges. You should avoid contact with these water bodies, especially during the three days after a rain event. Signs are posted along our streams to identify the City’s combined sewer outfalls and where contact with the water could be hazardous to your health.**

**For more information or to receive notice when combined sewer overflows are happening, please visit the City’s website at [www.cityoffortwayne.org](http://www.cityoffortwayne.org)”**

The following script is for use during the winter months (November – March) when weekly bacteriological testing is not being done:

**“Thank you for calling Fort Wayne City Utilities’ Combined Sewer Overflow Hotline.**

**This message is intended to give you information about water quality in Fort Wayne’s rivers and streams and to provide general information about the risks associated with combined sewer overflows.**

# Water Quality Hotline

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Currently, biological testing of the rivers has been suspended for the winter season. Testing will resume in April and this hotline will be updated weekly throughout the spring, summer and fall with the latest biological test data.

During periods of rain or snowmelt, Fort Wayne's 100-year old combined sewers can overflow, resulting in the discharge of an untreated combination of stormwater and sewage into our waterways.

Fort Wayne's three rivers as well as the downstream portion of the Spy Run Creek and the Baldwin Drain and Wayne Natural Drain Number 4 are affected by CSO discharges. You should avoid contact with these water bodies, especially during the three days after a rain event. Signs are posted along our streams to identify the City's combined sewer outfalls and where contact with the water could be hazardous to your health.

For more information or to receive notice when combined sewer overflows are happening, please visit the City's website at [www.cityoffortwayne.org](http://www.cityoffortwayne.org)

# Nine Minimum Controls – No. 9

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## 9.0 MONITORING TO CHARACTERIZE CSO IMPACTS AND EFFICACY OF CSO CONTROLS

EPA's NMC Guidance explains that the ninth NMC "involves visual inspections and other simple methods to determine the occurrence and apparent impacts of CSOs" and "is the precursor to the more extensive characterization and monitoring efforts to be conducted as part of the LTCP."

### 9.1 INTRODUCTION

The NMC are technology-based controls, applied on a site-specific basis, to reduce the magnitude, frequency, and duration of CSOs. The implementation of the NMC establishes the baseline conditions upon which the LTCP will be developed.

Monitoring is specifically included as the ninth NMC. The ninth NMC is titled "Monitoring to Characterize CSO Impacts and Efficacy of CSO Controls".

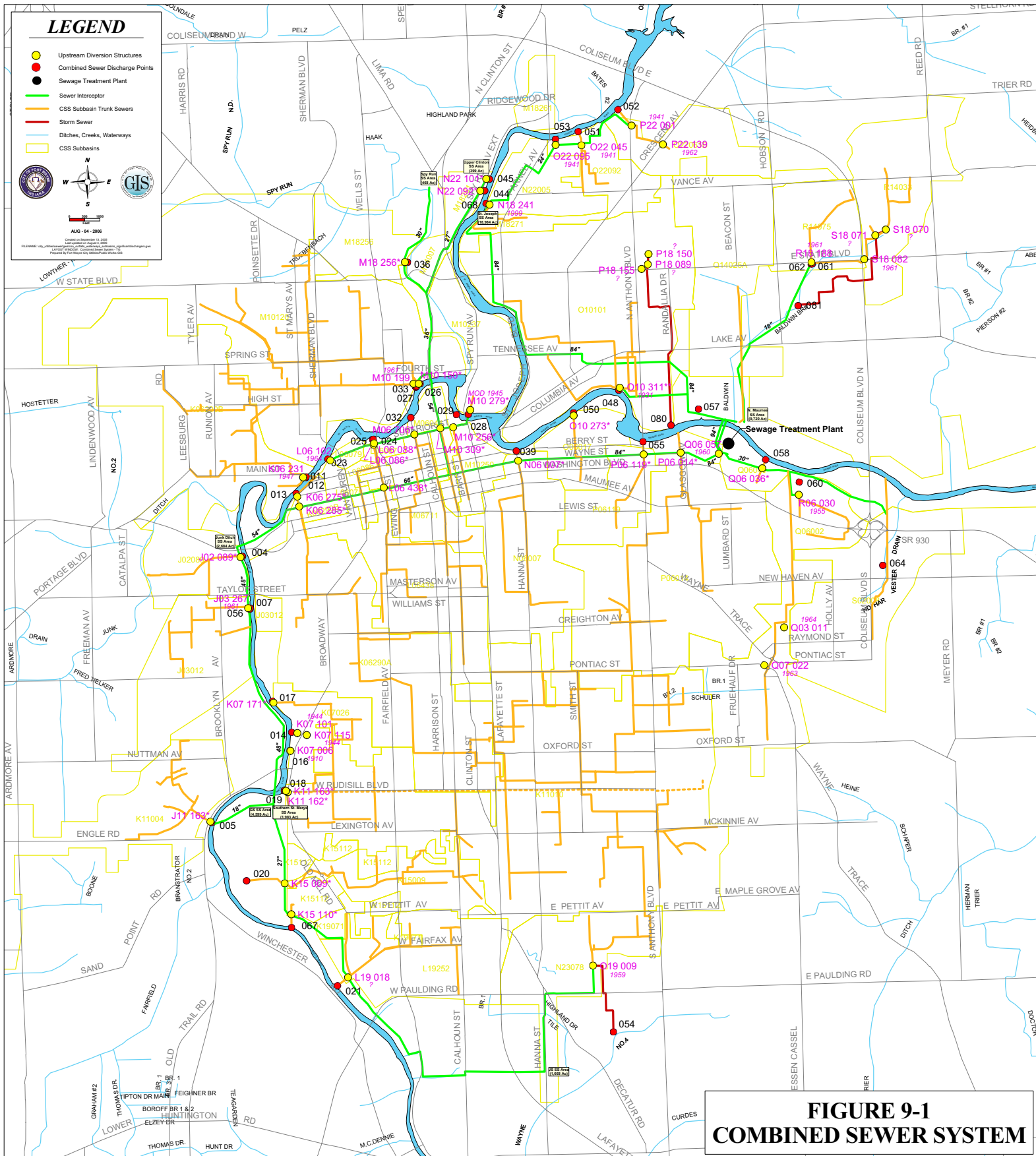
Implementation of this control would typically involve the following activities:

- Mapping the drainage area for the CSS, including the locations of all CSO outfalls and receiving waters.
- Identifying, for each receiving water body, designated and existing uses, applicable water quality criteria, and whether water quality standards (WQS) are currently being attained for both wet weather and dry weather.
- Developing a record of overflow occurrences (number, volume, frequency, and duration).
- Compiling existing information on water quality impacts associated with CSOs (e.g., beach closings, evidence of floatables wash-ups, fish kills, sediment accumulation, and the frequency, duration, and magnitude of instream WQS violations)."
- Developing a long-term monitoring plan for the LTCP.

### 9.2 IMPLEMENTATION OF THE NINTH MINIMUM CONTROL

#### 9.2.1 Mapping the CSS and Its Drainage Area

Fort Wayne's geographic information system (GIS) contains graphic information on all the sewers and sewer structures, including CSO regulators and discharge points, that the City operates and on all waters that receive discharges from its sewer system. The City's GIS also



## Nine Minimum Controls – No. 9

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contains information on sewer type (sanitary, storm, or combined), size, construction material, and age. This information has been used to delineate the areas served by major branches of each type of sewer. Figure 9-1 shows the CSS drainage subbasins, CSS trunk sewers, regulators, interceptors, CSO discharge points, and the water bodies that receive CSO discharges. This figure is typical of the type of maps that can be produced by the City's GIS.

### **9.2.2 Identification of Designated and Existing Uses, Water Quality Criteria, and Compliance Status**

All waters of the State of Indiana have been given fishable/swimmable use designations. For waters in the Great Lakes Basin, which includes the receiving waters of the City's CSS, the designated uses are described in 327 IAC 2-1.5-5. The applicable water quality standards (WQS) can be found in 327 IAC 2-1.5-8. Indiana's integrated water monitoring and assessment reports show that existing WQS are not being met at all times in receiving waters of the CSS. A more detailed discussion of this issue can be found in Exhibit I-1.

As detailed at Chapter 2 of the City's LTCP, the City has long conducted (in cooperation with IDEM) monthly water quality monitoring at six locations, an upstream and downstream location for each river, throughout the year. The City supplements its monthly sampling during the recreational season with weekly monitoring at the same six locations. Additionally, the City completed two significant river water quality sampling and characterization programs to further characterize receiving waters. A summary of these two programs and identified WQS excursions can be found in Exhibit I-2.

### **9.2.3 Monitoring of CSO Discharges**

The City has been visually inspecting its regulators and associated discharge points in compliance with the requirements of an Administrative Order issued by U.S. EPA in 2003. The number and size of wet weather events that caused overflows in 2006 at each regulator are summarized in Exhibit I-3. Also in compliance with the aforementioned Administrative Order, a metering program has been implemented to measure overflow volume and duration with respect to 39 CSO outfalls. Pump data is used to determine the duration and volume of discharges at another 5 CSO outfalls. The 2006 results of this program are summarized in Exhibit I-4.

### **9.2.4 Compilation of Information on Water Quality Impacts From CSO Discharges**

## Nine Minimum Controls – No. 9

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The information that exists on water quality impacts is not specific to CSOs. There is evidence of floatable trash (plastic bottles, aluminum cans, styrofoam, etc.) accumulating around bridges and riverbanks. The floatable trash, however, does not seem to be concentrated around or just downstream of CSO discharge points. This is discussed and illustrated in greater detail in Chapter 6 of the CSO Operations Plan. Indiana has issued fish advisories for CSO receiving waters, but the advisories are applicable upstream of the CSOs as well as downstream. A copy of the most recent fish advisory can be found in Exhibit I-5. Although several river sampling programs have been undertaken, the frequency, duration, and magnitude of instream WQS excursions can only be estimated and CSOs are not the only cause of these excursions. The City's rivers have been analyzed for fish advisory. Mercury and PCBs are the fish tissue contaminants identified. Both the 2004 and 2006 303(d) reports list only PCBs for a fish advisory. The City has tested CSOs and did not find PCBs present. This indicates that fish advisories are not a result of CSOs. There are no beaches in the area and, consequently, no beach closures occur. No fish kills have been reported in the sewer system's receiving waters for at least 10 years. Sediment accumulation has not caused or created any reported problems.

### 9.2.5 Summary of Findings

The City's review of existing information indicates that the sewer system's receiving waters do not meet all WQS all of the time. The water bodies assessed by the State of Indiana generally fully support aquatic life, partially support fish consumption, but do not support primary contact recreation at all times. Mercury and PCBs have been found in the tissue of some fish. River sampling has found a small number of exceedences for the CCC limits for cadmium, copper, and lead. No CMC exceedences were found. The collected data indicate that CSOs are not a significant source of these pollutants. Indeed, to the extent CSOs are a contributing source at all, the contribution is minor. Bacteria exceedences were found to be relatively frequent and applicable to all receiving waters. CSOs are a significant, but not only, contributing source of this pollutant.

### 9.2.6 Developing a Long-Term Monitoring Plan for the LTCP

Because the LTCP is based on more detailed knowledge of the CSS and receiving waters than is necessary to implement the NMC, the extent of characterization for the LTCP development is more sophisticated. The system components that must be examined as part of the LTCP's long-term monitoring plan include the CSS, combined sewage and CSOs, and the receiving waters. The process for examining these components can be broken into the following elements as described in the LTCP:

- Compilation and Analysis of Existing Data

## Nine Minimum Controls – No. 9

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- Combined Sewer System and Receiving Water Monitoring
- Combined Sewer System and Receiving Water Modeling

### 9.3 RECORDKEEPING

The City intends to continue CSO inspections and monitoring and as well as its ongoing monitoring for reported fish kills and advisories. The City further intends to continue its ongoing river water quality monitoring program. Annual results of the monitoring required by the ninth NMC will be kept with Exhibit I-7.

# Nine Minimum Controls – No. 9

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## DIRECTORY FOR APPENDIX I (Items Presented in Order of Appearance in Appendix I)

<b><u>Item</u></b>	<b><u>Description</u></b>
<b>Exhibit I-1</b>	<b>INTIGRATED MONITORING AND ASSESSMENT REPORT FINDINGS</b>
<b>Exhibit I-2</b>	<b>WATER QUALITY EXCURSION SUMMARY</b>
<b>Exhibit I-3</b>	<b>2004 REGULATOR OVERFLOW SUMMARY</b>
<b>Exhibit I-4</b>	<b>2007 INDIANA FISH CONSUMPTION ADVISORY - STREAMS AND RIVERS</b>
<b>Exhibit I-5</b>	<b>PARTIAL MONITORING PLAN</b>
<b>Exhibit I-6</b>	<b>RECORDKEEPING</b>

## **Nine Minimum Controls – No. 9**

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### **EXHIBIT I-1**

# Integrated Water Monitoring and Assessment Report

## Findings

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The information on the following pages is derived from Indiana's integrated water monitoring and assessment reports provided by Indiana Department of Environmental Management (IDEM) from both 2002 and 2004. Detailed information and maps of waterbodies assessed for WQS are included in this document for both 2002 and 2004.

There are two sections to this document. The first section includes detailed information on each waterbody segment. This includes waterbody segment name, waterbody segment ID, basin and size, level of designated use support, pollutants of concern and stressors. Information for both 2002 and 2004 are compared and summarized in this section. The second section includes a detailed map of the monitored waterbody segments along Spy Run Creek, and the St. Joseph, St. Mary's and Maumee Rivers. The map shows comparison of the six waterbodies assessed for designated use, pollutants of concern, and stressors.

Of the six areas assessed, two waterbodies show a change in monitoring results from 2002 to 2004. Waterbody segment INA0463\_T1003 on the St. Mary's River contained inorganics which was a moderate stressor in 2002. Inorganics were not found in 2004. More information was needed in 2004 to assess nutrient level. Waterbody segment INA0465\_T1002 of the St. Mary's River fully supported aquatic life in 2002, however this section was not assessed for aquatic life in 2004.

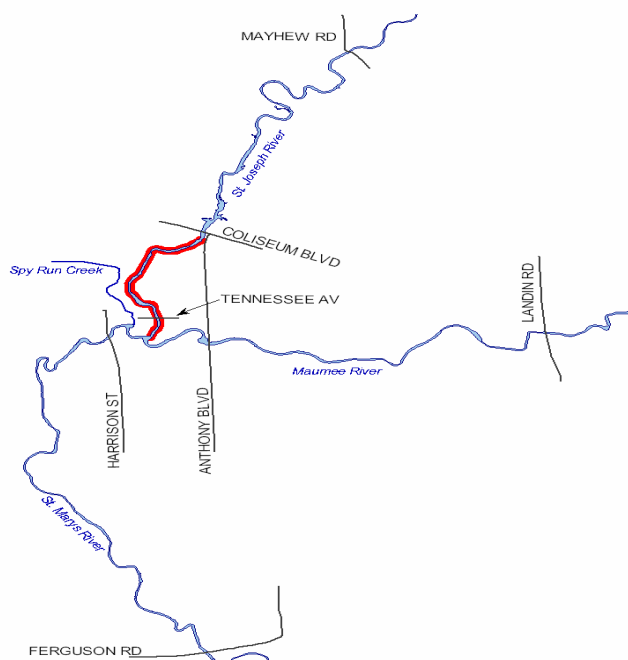
### FINDINGS BY WATERBODY SEGMENT

# Integrated Water Monitoring and Assessment Report

## Findings

Waterbody Name: St. Joseph River  
Waterbody segment ID: INA03A4\_M1042

Basin: Great Lakes  
Size: 3 miles



Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed  
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact				X

Pollutants of concern: FCA for PCB's & Hg  
PCBs: M  
Mercury: M

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact				X

Pollutants of concern: FCA for PCB's & Hg  
PCBs: M  
Mercury: M

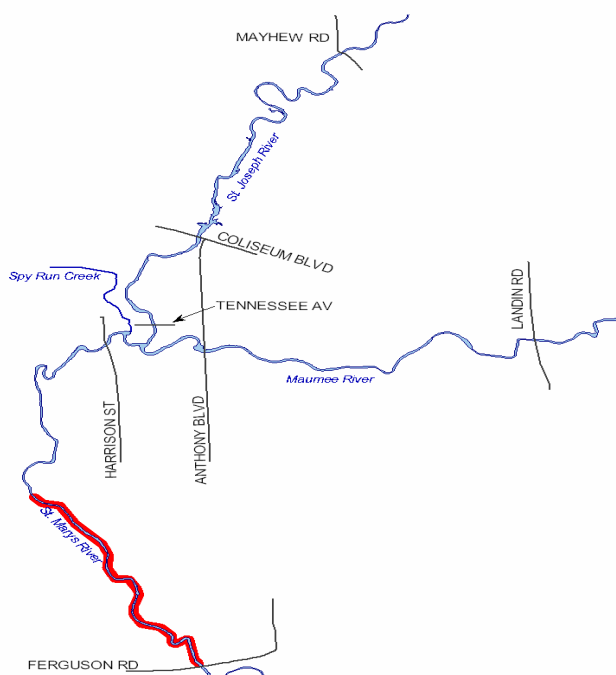
Waterbody segment INA03A4\_M1042 of the St. Joseph River fully supports aquatic life. This section of the St. Joseph River partially supports the designated use for fish consumption. Causes/stressors are pollutants or other stressors that adversely impact the designated uses of the St. Joseph River. PCBs and Mercury are the fish tissue contaminants identified in the fish consumption advisory with both being moderate stressors. Primary contact for recreational use is not assessed.

# Integrated Water Monitoring and Assessment Report

## Findings

Waterbody Name: St. Mary's River  
Waterbody segment ID: INA0463\_T1003

Basin: Great Lakes  
Size: 6.2 miles



Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed  
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*; FCA for PCBs & Hg  
PCBs: M  
Mercury: M  
Nutrients: T  
Pathogens: H

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*; FCA for PCBs & Hg

# Integrated Water Monitoring and Assessment Report

## Findings

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PCBs: M  
Mercury: M  
Other Inorganics: M  
Pathogens: H

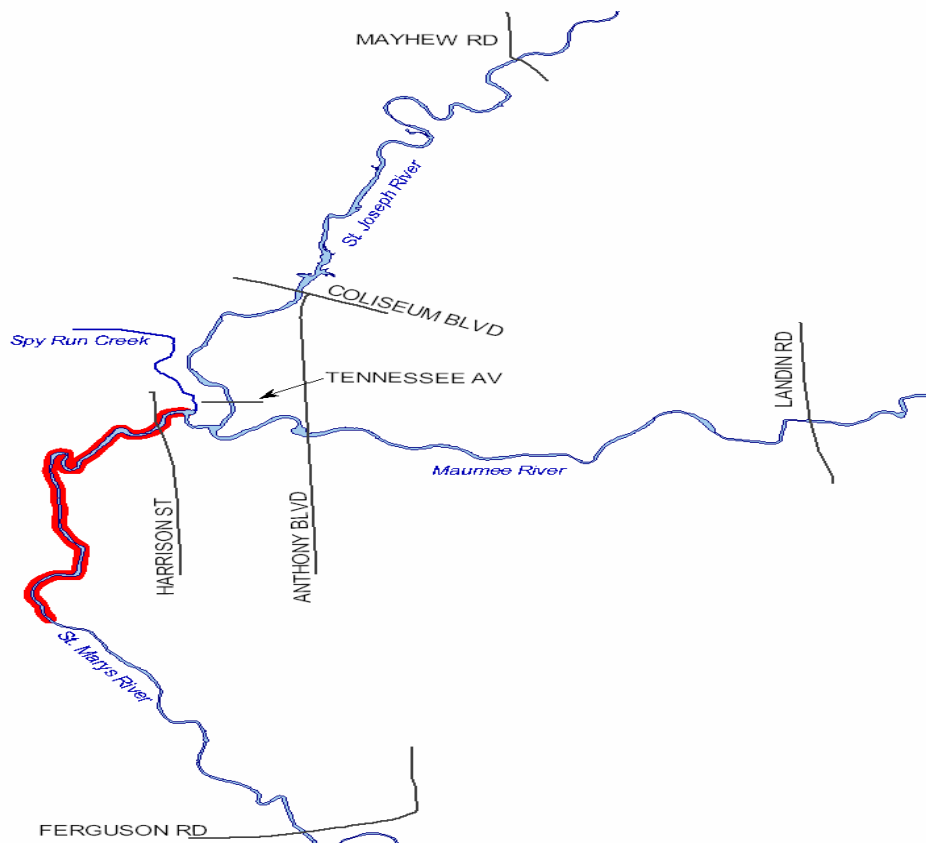
Waterbody segment INA0463\_T1003 of the St. Mary's River fully supports aquatic life. This section of the St. Mary's River partially supports the designated use for fish consumption. Causes/stressors are pollutants or other stressors that adversely impact the designated uses of the St. Mary's River. PCBs and Mercury are the fish tissue contaminants identified in the fish consumption advisory with both being moderate stressors. *E. Coli* is the indicator measure for bacteria and is rated as a high cause/stressor for pathogens. Primary contact for recreational use is not supported. More information is needed to assess nutrient stressors in 2004. Inorganics were found in 2002, but not in 2004.

# Integrated Water Monitoring and Assessment Report

## Findings

Waterbody Name: St. Mary's River  
Waterbody segment ID: INA0465\_T1002

Basin: Great Lakes  
Size: 4.4 miles



Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed  
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support				X
Fish Consumption		P		
Primary Contact				X

Pollutants of concern: FCA for PCBs & Hg  
PCBs: M  
Mercury: S

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support				X
Fish Consumption		P		
Primary Contact				X

Pollutants of concern: FCA for PCBs and Hg  
PCBs: M

# Integrated Water Monitoring and Assessment Report

## Findings

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Mercury: S

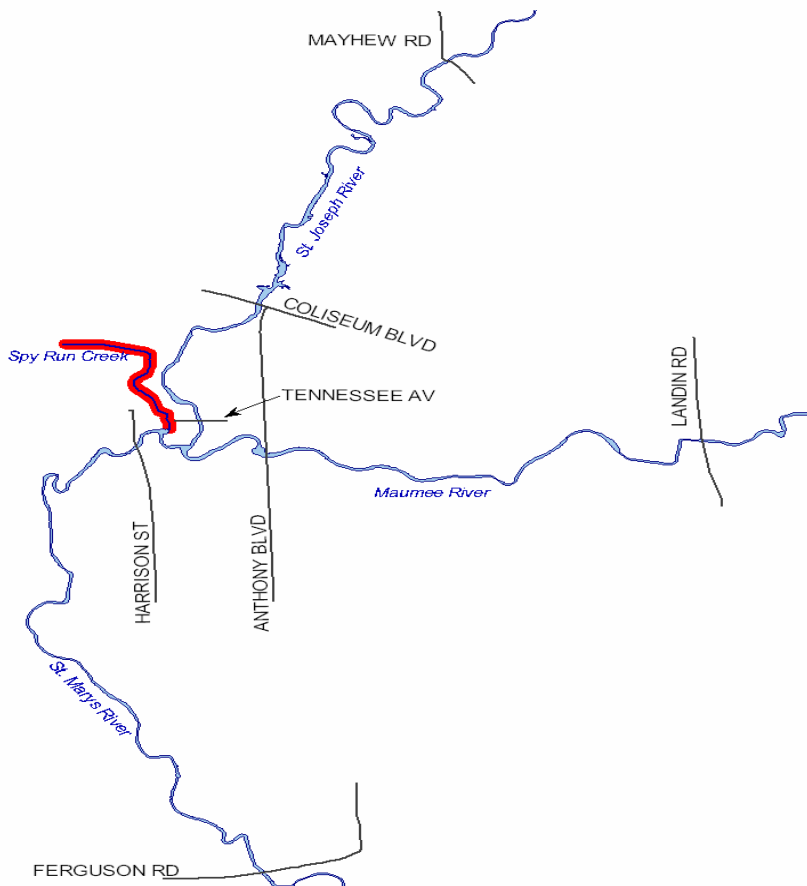
Waterbody segment INA0465\_T1002 of the St. Mary's River was not assessed for support of aquatic life or primary contact. This section of the St. Mary's River partially supports the designated use for fish consumption. Causes/stressors are pollutants or other stressors that adversely impact the designated uses of the St. Mary's River. PCBs and Mercury are the fish tissue contaminants identified in the fish consumption advisory with PCBs being a moderate stressor and mercury being a slight stressor.

# Integrated Water Monitoring and Assessment Report

## Findings

Waterbody Name: Spy Run Creek  
Waterbody segment ID: INA0466\_T1013

Basin: Great Lakes  
Size: 19.9 miles



Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed  
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support			N	
Fish Consumption				X
Primary Contact				X

Pollutants of concern: Impaired biotic communities  
Biotic Community Status: M

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support			N	
Fish Consumption				X
Primary Contact				X

Pollutants of concern: Impaired Biotic Community

# Integrated Water Monitoring and Assessment Report

## Findings

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Biotic Community Status: M

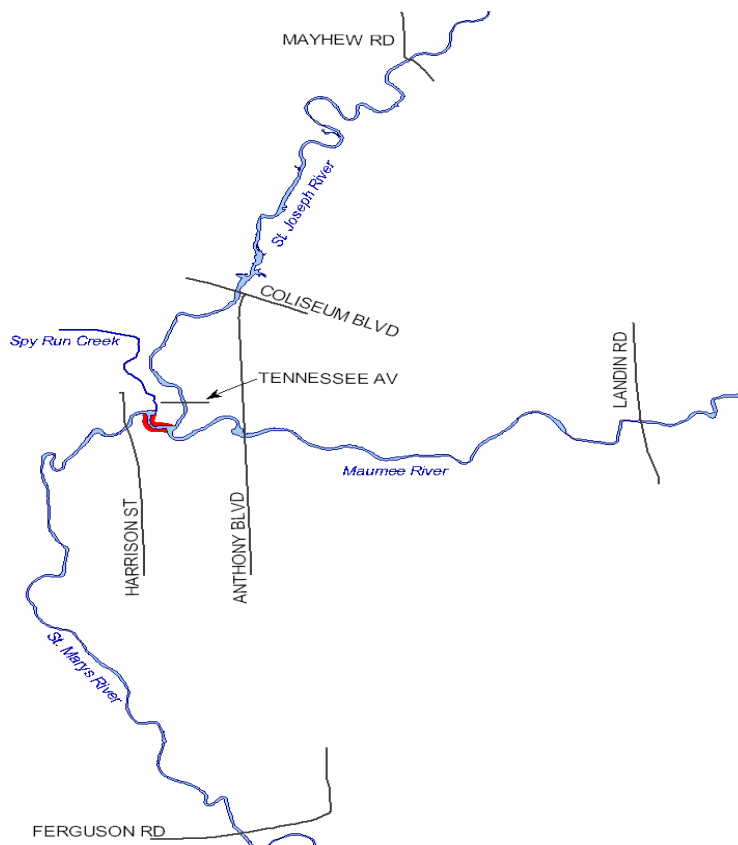
Waterbody segment INA0466\_T1013 of the Spy Run Basin does not support the designated use for aquatic life. An Impaired Biotic Community (IBC) means that a waterbody's aquatic life differs from the expectation of water that was unaffected by human activity. The Spy Run Creek was assessed for IBC and was found to be a moderate stressor. Designated use for fish consumption and primary contact were not assessed.

# Integrated Water Monitoring and Assessment Report

## Findings

Waterbody Name: St. Mary's River  
Waterbody segment ID: INA0466\_T1022

Basin: Great Lakes  
Size: 0.5 miles



Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed  
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*, FCA for PCBs & Hg

PCBs: M

Mercury: M

Pathogens: H

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*, FCA for PCBs and Hg

# Integrated Water Monitoring and Assessment Report

## Findings

---

PCBs: M  
Mercury: M  
Pathogens: H

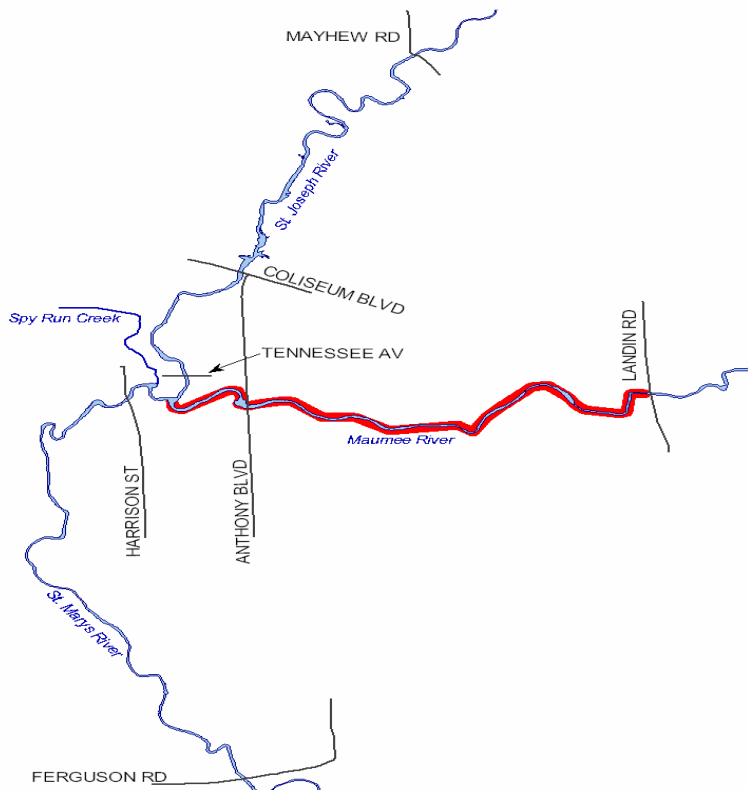
Waterbody segment INA0466\_T1022 of the St. Mary's River fully supports aquatic life. This section of the St. Mary's River partially supports the designated use for fish consumption. Causes/stressors are pollutants or other stressors that adversely impact the designated uses of the St. Mary's River. PCBs and Mercury are the fish tissue contaminants identified in the fish consumption advisory with both being moderate stressors. *E. Coli* is the indicator measure for bacteria and is rated as a high cause/stressor for pathogens. Primary contact for recreational use is not supported in this waterbody segment.

# Integrated Water Monitoring and Assessment Report

## Findings

Waterbody Name: Maumee River  
Waterbody segment ID: INA0511\_M1007

Basin: Great Lakes  
Size: 8.7 miles



Use support: F = Full support; P = Partial support; N = Non support; X = Not assessed  
Cause (stressor) rating: H = High; M = Moderate; S = slight; T = Needs more information

Designated Use 2004	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*, FCA for PCB & Hg  
PCBs: M  
Mercury: M  
Pathogens: M

Designated Use 2002	Full support	Partial support	Non support	Not assessed
Aquatic Life Support	F			
Fish Consumption		P		
Primary Contact			N	

Pollutants of concern: *E. Coli*, FCA for PCB & Hg  
PCB's: M  
Mercury: M

# Integrated Water Monitoring and Assessment Report

## Findings

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Pathogens: M

Waterbody segment INA0511\_M1007 of the Maumee River fully supports aquatic life. This section of the Maumee River partially supports the designated use for fish consumption. Causes/stressors are pollutants or other stressors that adversely impact the designated uses of the Maumee River. PCBs and Mercury are the fish tissue contaminants identified in the fish consumption advisory with both being moderate stressors. *E. Coli* is the indicator measure for bacteria and is rated as a moderate cause/stressor for pathogens. Primary contact for recreational use is not supported in this waterbody segment.

### FINDINGS BY DESIGNATED USE

## **Nine Minimum Controls – No. 9**

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### **EXHIBIT I-2**

# Water Quality Excursion Summary

## WATER QUALITY EXCURSION SUMMARY

Two significant river sampling programs have been undertaken on Fort Wayne's sewer system's receiving waters. The first study was conducted in 1996 by Malcolm Pirnie to Characterize the Impact of Combined Sewer Overflows (CSOs) on the St. Mary's, St. Joseph and Maumee Rivers. The most recent study was conducted in spring of 2005 on the relief channel in the Maumee River and two of the tributaries (Spy Run Creek and Baldwin Ditch). The purpose of the 2005 study is to characterize the impacts of CSOs on the tributaries and the relief channel. Parameters of the sampling programs are shown in Table 1.

**TABLE 1**  
**SAMPLING PROGRAM PARAMETERS**

Data Source	Locations	Frequency	Years	Parameters	Parameter Group
Malcolm Pirnie	6	11 dry weather samples (8/6 – 11/3)  4 rain events - 12 grab samples per event at each site	1996	22	TSS, CBOD <sub>5</sub> , total phosphorus, NH <sub>3</sub> -N, E. Coli, fecal coliform, pH, DO, total cyanide, hardness, volatiles, PCBs, pesticides, temp, metals - Cd, Cr, Cu, Pb, Hg, Ni, Ag, & Zn
City of Fort Wayne	9	2 dry weather samples (3/29) and (4/15)  2 rain events - <b>5/13</b> (sample 5/13, 5/14, 5/15, 5/16) - <b>5/19</b> (sample 5/19, 5/20, 5/21, 5/22)	2005	15	DO, NH <sub>3</sub> -N, pH, TDS, TSS, E. Coli, Phosphorus, CBOD <sub>5</sub> , metals - Ag, Cd, Cr, Cu, Pb, Ni, Zn

### 1996 SAMPLING PROGRAM

The first sampling program was conducted in 1996 by Malcolm Pirnie. Samples were taken from six sites for both dry and wet weather events. Table 2 shows the sampling locations used in this study.

**TABLE 2**  
**SAMPLING LOCATIONS**

Sampling Site	River	Location on River
Mayhew Rd. Bridge	St. Joseph	Significantly upstream of CSOs
Ferguson Rd. Bridge	St. Mary's	Significantly upstream of CSOs
Landin Rd. Bridge	Maumee	Downstream of CSOs and tributaries
Tennessee Ave. Bridge	St. Joseph	Near confluence & downstream of CSOs
Harrison St. Bridge	St. Mary's	Near confluence & downstream of tributaries and CSOs
Anthony Blvd. Bridge	Maumee	Near confluence and upstream of Pond outfalls

The sampling data can be found in Appendix A and Appendix C of "Impact Characterization of Combined Sewer Overflows" completed by Malcolm Pirnie in September 1998. The dry weather sampling results show that the three rivers meet Water Quality Standards (WQS) for most parameters.

# Water Quality Excursion Summary

The Indiana Administrative Code states that the “Criterion Continuous Concentration” (CCC) is an estimate of the highest concentration of material an aquatic community can be exposed to indefinitely. The “Criterion Maximum Concentration” (CMC) is an estimate of the highest concentration of material an aquatic community can “briefly” be exposed to. Although there were CCC excursions during dry weather, there were no CMC excursions. The frequency of CCC excursions do not indicate this is a chronic condition. Table 3 shows CCC WQS excursions during dry weather.

**TABLE 3  
DRY WEATHER WQS EXCURSIONS**

Parameter	Date	Time	Location	Hardness (mg/l CaCO <sub>3</sub> )	CCC Allowable (ug/l)	Actual (ug/l)
Cadmium	8/6/96	12:55 p.m.	Tennessee @ St. Joseph	328	6.2	13
Copper	10/16/96	11:10 a.m.	Harrison @ St. Mary's	308	24	26

E. Coli is the indicator organism for pathogens. E. Coli standards are 125 colonies per 100 ml, based on a geometric mean of 5 samples over a 30-day period and a maximum E. Coli count of 235 colonies per 100 ml in any one sample. Averages of E. Coli samples during dry weather are listed below:

- Mayhew at St. Joseph = 90 colonies/100 ml
- Tennessee at St. Joseph = 106 colonies/100 ml
- Ferguson at St. Mary's = 240 colonies/100 ml
- Harrison at St. Mary's = 314 colonies/100 ml
- Anthony at Maumee = 192 colonies/100 ml
- Landin at Maumee = 238 colonies/100 ml

Wet weather sampling results did not differ that much from the dry weather sampling results for WQS excursions. Both cadmium and copper exceeded CCC WQS for wet weather. Again, cadmium and copper exceeded CCC limits, but did not exceed CMC limits indicating this is not a chronic condition. Table 4 shows CCC WQS excursions for cadmium and copper during wet weather.

**TABLE 4  
WET WEATHER WQS EXCURSIONS**

Parameter	Event	Date	Time	Location	Hardness (mg/l CaCO <sub>3</sub> )	CCC Allowable (ug/l)	Actual (ug/l)
Cadmium	1	9/21/96	7:35 p.m.	Mayhew @ St. Joseph	302	5.9	10
Cadmium	1	9/22/96	4:15 p.m.	Tennessee @ St. Joseph	266	5.3	10
Copper	2	9/27/96	9:30 a.m.	Harrison @ St. Mary's	217	18	20

The wet weather sampling results show that E. Coli counts increased significantly at all six sites. E. Coli exceeded WQS at all six sampling sites during all 4 wet weather events. The Maumee River levels were higher than the St. Mary's and St. Joseph Rivers with the highest concentration at Anthony Blvd., near the confluence, for events 3 and 4. The average E. Coli concentrations for each wet weather event at each site is listed below in Table 5.

# Water Quality Excursion Summary

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**TABLE 5**  
**AVERAGE WET WEATHER E. COLI CONCENTRATIONS**

<b>River Sampling Site</b>	<b>Event 1</b>	<b>Event 2</b>	<b>Event 3</b>	<b>Event 4</b>
Mayhew at St. Joseph	413	1,444	341	427
Tennessee at St. Joseph	2,599	2,381	650	1,158
Ferguson at St. Mary's	800	5,070	1,238	610
Harrison at St. Mary's	14,823	20,957	2,785	6,779
Anthony at Maumee	7,078	7,312	11,270	7,379
Landin at Maumee	2,292	9,198	1,134	2,758

## 2005 SAMPLING PROGRAM

The most recent water quality study was conducted by the City of Fort Wayne in Spring 2005. The purpose of the 2005 study is to characterize the impacts of CSOs on the tributaries and the relief channel. A relief channel was constructed by the Army Corps of Engineers to assist in flood relief. In addition to the relief channel, two tributaries, Spy Run Creek and Baldwin Ditch were also evaluated for CSO affects on them. Sampling sites along the Baldwin Ditch, Spy Run Creek, the Maumee River and the Maumee Relief Channel were analyzed during both dry and wet weather events. Locations of each sampling site are listed below. A diagram of the sampling points can be found in figures 1-6.

Baldwin U = Upstream Baldwin Ditch

Baldwin D = Downstream Baldwin Ditch

Spy Run U = Upstream Spy Run Creek

Spy Run D = Downstream Spy Run Creek

Relief RCD-1 = The Maumee relief channel where Baldwin ditch enters the relief channel and upstream of the rock dam

Relief RC-4 = Downstream of the rock dam and upstream of Pond 3 outfall in the relief channel

River MR-6 = Parallel to RC-4 in the Maumee River

Lower Relief LRC-5 = Downstream of Coliseum Bridge

River MR-7 = Downstream of Coliseum Bridge

The sampling data can be found in Appendix A.

The two dry weather sampling days were conducted on 3/29/05 and 4/15/05. Ammonia did not meet WQS for one dry sampling event on relief channel at RCD-1. This site is located at the end of Baldwin Ditch. There is very little flow through the Baldwin Ditch during dry weather and the stream passes through a goose populated area. The highest E. Coli sample was upstream on the Baldwin Ditch which exceeded WQS for all dry weather samples. Baldwin Ditch also exceeded WQS at the downstream sampling site for 50% of the dry weather samples collected. E. Coli exceeded WQS on both the upstream and downstream sampling sites on the Spy Run Creek for 50% of the dry weather samples collected.

Data was collected from two significant wet weather events. Sampling took place on the day of each rain event and three consecutive days following to show the effect of CSOs during wet weather events. Table 6 shows the days samples were collected.

# Water Quality Excursion Summary

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**TABLE 6**  
**WET WEATHER SAMPLING DATES**

<b>Rain Event</b>	<b>Days Sampled</b>
May 13, 2005	May 13, 14, 15, & 16
May 19, 2005	May 19, 20, 21, & 22

For wet weather events, increased ammonia-nitrate concentrations were present at RCD-1. This is most likely due to the Baldwin Ditch along with the pooling effect upstream of the rock dam.  $\text{NH}_3\text{-N}$  did not meet WQS at Relief RCD-1 for events 1 and 2.  $\text{NH}_3\text{-N}$  was also high at this site during dry weather sampling. Copper exceeded CCC WQS during the first rain event at the downstream sampling site on the Spy Run Creek. All other metals tested met WQS.

As expected, higher concentrations of E. Coli were present after wet weather events. Both upstream and downstream sites on the Baldwin ditch exceeded WQS and had the highest E. Coli concentration for each wet weather event. RCD-1 also had high E. Coli concentrations and exceeded WQS for each wet weather event. Both upstream and downstream sites on the Spy Run Creek exceeded WQS during each wet weather event except once, which was upstream. The lowest E. Coli concentration was sampled at MR-7 and LRC-5 along with MR-6 and RC-4. E. Coli concentrations are found to be similar in both the relief channel and the main channel of the Maumee River.

The main channel and the relief channel displayed similar values for each parameter tested during both dry and wet weather events. This data supports that the main channel and the relief channel of the Maumee River share similar water quality characteristics.

## **Nine Minimum Controls – No. 9**

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### **EXHIBIT I-3**

**MINIMUM RAIN EVENT TRIGGERING CSO's**  
**year: 2004**

Monitoring Point	Overflow Events			Events that Caused Overflows	Correlation	Related Rain Gauge Site
	events	total	percent	min.		
4	15	75	20%	> .3"	poor	Study
5	32	70	46%	> .2"	good	Study
7*		0			good	Study
11	9	66	14%	> 1.0"	good	Study
12*		0			good	Study
13a	12	78	15%	> .25"	poor	City-County Bldg.
13b**		?				Fairfield
14a	3	88	3%	> .5"	poor	Fairfield
14b	1	88	1%	> .5"	good	Fairfield
16	3	88	3%	> 2.0"	good	Fairfield
17	39	88	44%	> .1"	fair	Fairfield
18	52	92	57%	> .01"	good	Harrison
19	36	92	39%	> .1"	fair	Harrison
20a	37	89	42%	> .2"	good	Harrison
21	56	92	61%	> .01"	good	Harrison
23	32	65	49%	> .1"	good	City-County Bldg.
24	21	65	32%	> .3"	poor	City-County Bldg.
25	31	65	48%	> .2"	good	City-County Bldg.
26	10	67	15%	> .1"	poor	Tecumseh
27*		0			good	Little Turtle
28	25	72	35%	> .1"	poor	Tecumseh
29a	27	65	42%	> .2"	fair	City-County Bldg.
29b	37	65	57%	> .1"	good	City-County Bldg.
32	40	65	62%	> .1"	good	City-County Bldg.
33	38	67	57%	> .1"	good	Little Turtle
36	8	67	12%	> .3"	poor	Tecumseh
39**		?				City-County Bldg.
44	12	67	18%	> .4"	poor	Little Turtle
45	14	67	21%	> .4"	poor	Little Turtle
48	34	66	52%	> .1"	fair	Tecumseh
50	21	78	27%	> .1"	poor	City-County Bldg.
51	19	72	26%	> .2"	poor	Tecumseh
52a	15	72	21%	> .1"	poor	Tecumseh

**MINIMUM RAIN EVENT TRIGGERING CSO's**  
**year: 2004**

Monitoring Point	Overflow Events			Events that Caused Overflows	Correlation	Related Rain Gauge Site
	events	total	percent	min.		
52b	32	72	44%	> .1"	fair	Tecumseh
53	21	72	29%	> .2"	poor	Tecumseh
54	9	32	28%	> .3"	fair	Irwin
55a	35	78	45%	> .02"	poor	City-County Bldg.
56	14	66	21%	> .5"	fair	Study
57a**		?				Bunche
57b	34	89	38%	> .01"	fair	Fairfield
58	17	84	20%	> .2"	poor	Adams
60	36	85	42%	> .1"	fair	Adams
61	36	72	50%	> .1"	fair	Tecumseh
62	15	78	19%	> .2"	poor	Tecumseh
64a	27	75	36%	> .25"	fair	Bunche
64b		0			good	Bunche
67	23	89	26%	> .3"	poor	Harrison Hills
68	11	72	15%	> .5"	poor	Tecumseh
P18-089	4	72	6%	> 1.0"	fair	Tecumseh
P18-150	14	72	19%	> .4"	poor	Tecumseh
P18-155	9	72	13%	> .1"	poor	Tecumseh

\* tide gate manually operated

\*\* can't visually inspect

## **Nine Minimum Controls – No. 9**

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### **EXHIBIT I-4**

# 2007 Indiana Fish Consumption Advisory

## Streams and Rivers

Location	Species	Fish Size (Inches)	Contaminant	Group
<b>All Indiana Rivers and Streams</b>				
<b>All Counties</b> (unless specified otherwise)	<b>Carp</b>	15-20	<input type="checkbox"/>	3
		20-25	<input type="checkbox"/>	4
		25+	<input type="checkbox"/>	5
<b>Aboit Creek</b>				
Allen County	Creek Chub	Up to 5		1
<b>Anderson River</b> Perry County	Black Buffalo	25+	<input type="checkbox"/>	3
	Bluegill	Up to 7		1
	Carp	22+	<input type="checkbox"/>	2
Spencer County	Channel Catfish	13+	<input type="checkbox"/>	3
<b>Beanblossom Creek</b>				
Monroe County	Channel Catfish	13+	<input type="checkbox"/>	3
<b>Big Blue River</b> Henry County	Carp	19-24	<input type="checkbox"/>	3
		24+	<input type="checkbox"/>	4
	Rock Bass	4-7	<input type="checkbox"/>	3
		7+	<input type="checkbox"/>	4
Rush County	White Sucker	8-10	<input type="checkbox"/>	3
		10+	<input type="checkbox"/>	4
	Carp	19-24	<input type="checkbox"/>	3
		24+	<input type="checkbox"/>	4
Shelby County	Carp	19-24	<input type="checkbox"/>	3
		24+	<input type="checkbox"/>	4
	Golden Redhorse	Up to 18	<input type="checkbox"/>	3
		18+	<input type="checkbox"/>	4
Johnson County	Northern Hogsucker	9-10	<input type="checkbox"/>	3
		10+	<input type="checkbox"/>	4
	River Redhorse	14+	<input type="checkbox"/>	3
	Rock Bass	4+	<input type="checkbox"/>	3
	Smallmouth Bass	15+	<input type="checkbox"/>	3
	Carp	19-24	<input type="checkbox"/>	3
Johnson County	Longear Sunfish	24+	<input type="checkbox"/>	4
	Northern Hogsucker	8-10	<input type="checkbox"/>	3
		10+	<input type="checkbox"/>	4
	Rock Bass	7+	<input type="checkbox"/>	3
	Smallmouth Bass	5-8	<input type="checkbox"/>	3
		8+	<input type="checkbox"/>	4
<b>Big Camp Creek</b> Jefferson County	Longear Sunfish	Up to 5		1
<b>Big Creek</b> Jefferson County	Longear Sunfish	Up to 5		1

Location	Species	Fish Size (Inches)	Contaminant	Group
<b>Big Monon Creek</b> White County	Longear Sunfish	Up to 4		1
	White Sucker	Up to 10		1
<b>Big Pine Creek</b> Warren County	Black Redhorse	Up to 13		1
	Flathead Catfish	Up to 10		1
	Longear Sunfish	Up to 5		1
	Smallmouth Bass	11+	<input type="checkbox"/>	3
<b>Big Raccoon Creek</b> Parke County	Black Redhorse	Up to 11		1
	Carp	Up to 22	<input type="checkbox"/>	2
<b>Blue River</b> Harrison County		22+	<input type="checkbox"/>	3
	Carp	28-29	<input type="checkbox"/>	2
	Channel Catfish	15+	<input type="checkbox"/>	3
	Longear Sunfish	Up to 5		1
	Rock Bass	Up to 7		1
	Shorthead Redhorse	17+	<input type="checkbox"/>	3
<b>Buck Creek</b> Delaware County	Spotted Bass	10+	<input type="checkbox"/>	3
	Longear Sunfish	5-6	<input type="checkbox"/>	3
		6+	<input type="checkbox"/>	4
	White Sucker	14+	<input type="checkbox"/>	3
<b>Cedar Creek</b> Allen County	Carp	Up to 22	<input type="checkbox"/>	2
	River Chub	4+	<input type="checkbox"/>	3
	Channel Catfish	18+	<input type="checkbox"/>	3
<b>Christiana Creek</b> Elkhart County	Northern Hogsucker	Up to 14		1
	Rock Bass	Up to 7		1
	Yellow Bullhead	Up to 9		1
<b>Clear Creek</b> Monroe County	<b>ALL SPECIES</b>	<b>ALL</b>	<input type="checkbox"/>	<b>5</b>
<b>Clear Creek</b> Whitley County	Creek Chub	Up to 7		1
<b>Crooked Creek</b> Steuben County	Carp	23+	<input type="checkbox"/>	2
<b>Deer Creek</b> Carroll County	Carp	Up to 19	<input type="checkbox"/>	2
		19+	<input type="checkbox"/>	3
	Longear Sunfish	Up to 5		1
	Smallmouth Bass	10+	<input type="checkbox"/>	3

General Population ☐ = Mercury ☐ = PCBs  
 Group 1 = Unlimited meals Group 2 = 1 meal/week Group 3 = 1 meal/month  
 Group 4 = 1 meal/2 months Group 5 = DO NOT EAT  
 (For women and children, please refer to the Guidelines on page 5.)

<b>Eagle Creek</b> Marion County	<b>Channel Catfish</b>	Up to 20 20-23 23+	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	3 4 5
<b>Easterday Ditch</b> Kosciusko County	White Sucker	13+	<input type="checkbox"/>	3
<b>East Fork of White Lick Creek</b> Hendricks County	Carp	Up to 23 23+	<input type="checkbox"/> <input type="checkbox"/>	2 3
<b>East Fork of White River</b> Bartholomew County	Creek Chub	9+	<input type="checkbox"/>	3
	Northern Hogsucker	11+	<input type="checkbox"/>	3
	Yellow Bullhead	10+	<input type="checkbox"/>	3
	Carp	Up to 18 18-23 23+	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1 2 3
	Flathead Catfish	Up to 13 24+	<input type="checkbox"/> <input type="checkbox"/>	1 3
	Golden Redhorse	13+	<input type="checkbox"/>	3
	Bigmouth Buffalo	18+	<input type="checkbox"/>	3
	Carp	Up to 18 18-23 23+	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1 2 3
	Channel Catfish	Up to 14	<input type="checkbox"/>	1
	Flathead Catfish	Up to 13	<input type="checkbox"/>	1
	Golden Redhorse	14-16 16+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Silver Redhorse	22+	<input type="checkbox"/>	3
	Smallmouth Bass	13+	<input type="checkbox"/>	3
	Smallmouth Buffalo	19-26 26+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Channel Catfish	Up to 15 15-21 21+	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	3 4 5
	Freshwater Drum	10+	<input type="checkbox"/>	3
	Bigmouth Buffalo	Up to 18 18+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Flathead Catfish	10-16 16+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Largemouth Bass	Up to 11 11-14 14+	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	3 4 5
	Longear Sunfish	3+	<input type="checkbox"/>	3
	River Carpsucker	15+	<input type="checkbox"/>	3
	Sauger	14+	<input type="checkbox"/>	3

<b>East Fork of White River Cont.</b> Lawrence County Cont.	<b>Shorthead Redhorse</b>	Up to 14 14-16 16+	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	3 4 5
	<b>Smallmouth Buffalo</b>	Up to 15 15+	<input type="checkbox"/> <input type="checkbox"/>	4 5
	Spotted Sucker	17+	<input type="checkbox"/>	3
	Striped Bass	22+	<input type="checkbox"/>	4
	Carp	Up to 23 23+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Channel Catfish	12-19 20+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Freshwater Drum	10+	<input type="checkbox"/>	3
	Longear Sunfish	3+	<input type="checkbox"/>	3
	<b>Shorthead Redhorse</b>	Up to 14 14-16 16+	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	3 4 5
	<b>Smallmouth Buffalo</b>	Up to 15 15+	<input type="checkbox"/> <input type="checkbox"/>	4 5
	Carp	22-24 24+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Channel Catfish	19+	<input type="checkbox"/>	3
	Flathead Catfish	24+	<input type="checkbox"/>	3
	Longear Sunfish	4+	<input type="checkbox"/>	3
<b>East Fork of Whitewater River</b> Wayne County	Channel Catfish	12-16 16+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Longear Sunfish	Up to 6	<input type="checkbox"/>	1
	Northern Hogsucker	Up to 9	<input type="checkbox"/>	1
<b>East Fork of Wildcat Creek</b> Howard County	Carp	Up to 23 23+	<input type="checkbox"/> <input type="checkbox"/>	2 3
<b>Eel River (West Fork White River Basin)</b> Greene County	Sauger	18+	<input type="checkbox"/>	3
<b>Eel River (Upper Wabash River Basin)</b> Whitley/Wabash/Miami/Cass Counties				
<i>Consumption of fish from the Eel River should be limited to no more than one meal per month (Group 3) for the general population and NO CONSUMPTION by the at-risk population. Exceptions to this advice for the general population are listed below.</i>				
	Bluegill	6+	<input type="checkbox"/>	4
	Carp	24+	<input type="checkbox"/>	4

General Population    ☐ = Mercury    ☐ = PCBs  
Group 1 = Unlimited meals    Group 2 = 1 meal/week    Group 3 = 1 meal/month  
Group 4 = 1 meal/2 months    Group 5 = DO NOT EAT  
(For women and children, please refer to the Guidelines on page 5.)

Location	Species	Fish Size (inches)	Contaminant	Group
Elkhart River Elkhart County	Rock Bass	9+	<input type="checkbox"/>	3
	Smallmouth Bass	17+	<input type="checkbox"/>	3
	White Sucker	16+	<input type="checkbox"/>	3
Elkhorn Creek Randolph County	Creek Chub	Up to 3		1
Elliott Ditch Tippecanoe County	ALL SPECIES	ALL	<input type="checkbox"/>	5
Fall Creek Madison County	Carp	19-22	<input type="checkbox"/>	3
		22+	<input type="checkbox"/>	4
	Channel Catfish	Up to 22	<input type="checkbox"/>	3
	Rock Bass	22+	<input type="checkbox"/>	4
		7+	<input type="checkbox"/>	3
	Smallmouth Bass	15+	<input type="checkbox"/>	3
Fall Creek (Upstream of Geist Reservoir) Hamilton County	Carp	16-23	<input type="checkbox"/>	2
		23+	<input type="checkbox"/>	3
	Channel Catfish	25+	<input type="checkbox"/>	3
Marion County	Carp	Up to 20	<input type="checkbox"/>	4
		20+	<input type="checkbox"/>	5
	Channel Catfish	Up to 18	<input type="checkbox"/>	3
		18-20	<input type="checkbox"/>	4
		20+	<input type="checkbox"/>	5
	Largemouth Bass	14+	<input type="checkbox"/>	3
Flatrock River Rush County	Longear Sunfish	All		1
Shelby County	Carp	22-23	<input type="checkbox"/>	2
		23+	<input type="checkbox"/>	3
	Flathead Catfish	Up to 18		1
Bartholomew County	Longear Sunfish	All		1
		All		1
	Longear Sunfish	All		1
Galena River (South Branch) LaPorte County	Creek Chub	Up to 7	<input type="checkbox"/>	3
Graham Creek Jennings County	Longear Sunfish	Up to 6		1

General Population  
 Group 1 = Unlimited meals  
 Group 2 = 1 meal/week  
 Group 3 = 1 meal/month  
 Group 4 = 1 meal/2 months  
 Group 5 = DO NOT EAT  
 (For women and children, please refer to the Guidelines on page 5.)

☐ = Mercury  
☐ = PCBs

Location	Species	Fish Size (inches)	Contaminant	Group
Great Miami River Dearborn County	Carp	16-20	<input type="checkbox"/>	4
		20+	<input type="checkbox"/>	5
	Channel Catfish	Up to 15	<input type="checkbox"/>	4
		15+	<input type="checkbox"/>	5
	Largemouth Bass	18+	<input type="checkbox"/>	3
	White Crappie	8-11	<input type="checkbox"/>	3
Hanna Creek Union County		11+	<input type="checkbox"/>	4
	Carp	Up to 16		1
		16+	<input type="checkbox"/>	2
Honey Creek White County	Largemouth Bass	20+	<input type="checkbox"/>	3
Indian Creek (Whitewater Basin) Union County	Carp	Up to 9	<input type="checkbox"/>	1
Indian Creek (Ohio River Valley) Harrison County		9+	<input type="checkbox"/>	2
	Flathead Catfish	Up to 13		1
	Longear Sunfish	Up to 6		1
Iroquois River Jasper/Newton Counties	Carp	Up to 19		1
		28+	<input type="checkbox"/>	3
	Channel Catfish	Up to 18		1
	Golden Redhorse	Up to 15		1
	Rock Bass	Up to 6		1
	Shorthead Redhorse	Up to 12		1
Juday Creek St. Joseph County	White Sucker	17+	<input type="checkbox"/>	3
Kankakee River LaPorte/Lake/Newton Counties	Bigmouth Buffalo	22+	<input type="checkbox"/>	3
	Black Crappie	Up to 10		1
	Bluegill	Up to 6		1
	Quillback	15+	<input type="checkbox"/>	3
	Rock Bass	Up to 8		1
	Shorthead Redhorse	Up to 13		1
	Silver Redhorse	20+	<input type="checkbox"/>	3
Smallmouth Buffalo		22-28	<input type="checkbox"/>	3
		28-32	<input type="checkbox"/>	4
		32+	<input type="checkbox"/>	5
	White Crappie	Up to 9		1

Location	Species	Fish Size (inches)	Contaminant	Group
Killbuck Creek Madison County	Carp	19-23	<input type="checkbox"/>	2
		23+	<input type="checkbox"/>	3
	Longear Sunfish	5-6	<input type="checkbox"/>	3
		6+	<input type="checkbox"/>	4
	Smallmouth Bass	13+	<input type="checkbox"/>	3
	Carp	Up to 12		1
Kilmore Creek Clinton County	Creek Chub	Up to 7		1
Kokomo Creek Howard County	ALL SPECIES	ALL	<input type="checkbox"/>	5
Laughery Creek Dearborn/Ohio Counties	Carp	All	<input type="checkbox"/>	2
	White Crappie	Up to 10		1
	Bluegill	Up to 7		1
Little Blue River (Ohio River Basin) Crawford County	Carp	Up to 23		1
	Channel Catfish	16+	<input type="checkbox"/>	3
	Freshwater Drum	18+	<input type="checkbox"/>	3
	Largemouth Bass	Up to 10		1
	Sauger	18+	<input type="checkbox"/>	3
	White Crappie	14+	<input type="checkbox"/>	3
	White Crappie	Up to 9		1
Little Blue River Shelby County	Northern Hogsucker	11+	<input type="checkbox"/>	3
Little Calumet River Lake County	Carp	ALL	<input type="checkbox"/>	5
	White Sucker	Up to 11		1
	Yellow Bullhead	Up to 10		1
	Black Buffalo	All	<input type="checkbox"/>	3
	Bluegill	Up to 7		1
	Carp	Up to 22	<input type="checkbox"/>	3
	Flathead Catfish	23+	<input type="checkbox"/>	4
Little Mississinewa River Randolph County	ALL SPECIES	ALL	<input type="checkbox"/>	5
	Bluegill	Up to 5		1
	Channel Catfish	17+	<input type="checkbox"/>	3
	Freshwater Drum	19+	<input type="checkbox"/>	3
	Largemouth Bass	11+	<input type="checkbox"/>	3
	Sauger	18+	<input type="checkbox"/>	3
	Creek Chub	Up to 5		1
Little Pipe Creek Miami County				
Little Salt Creek Lawrence County	Longear Sunfish	Up to 4		1

Location	Species	Fish Size (inches)	Contaminant	Group
Little Sugar Creek/East Fork White River Basin Hancock County	Creek Chub	All	<input type="checkbox"/>	3
Little Sugar Creek/Walnut Fork Sugar Creek to Sugar Creek Montgomery County	ALL	ALL	<input type="checkbox"/>	5
Maumee River Allen County	Bigmouth Buffalo	20+	<input type="checkbox"/>	3
	Carp	Up to 20	<input type="checkbox"/>	4
		20-22	<input type="checkbox"/>	5
	Channel Catfish	14-16	<input type="checkbox"/>	3
		16+	<input type="checkbox"/>	4
	Freshwater Drum	All	<input type="checkbox"/>	3
	Largemouth Bass	9+	<input type="checkbox"/>	3
	River Redhorse	12-14	<input type="checkbox"/>	3
		14+	<input type="checkbox"/>	4
	Rock Bass	7-8	<input type="checkbox"/>	3
Middle Fork Wildcat Creek Tippecanoe County		8+	<input type="checkbox"/>	4
	Sauger	24+	<input type="checkbox"/>	3
	Shorthead Redhorse	14-16	<input type="checkbox"/>	3
		16+	<input type="checkbox"/>	4
	Walleye	Up to 21	<input type="checkbox"/>	4
		21+	<input type="checkbox"/>	5
	Black Redhorse	Up to 10		1
	Carp	Up to 22	<input type="checkbox"/>	2
		22+	<input type="checkbox"/>	3
	Golden Redhorse	Up to 10		1
Mill Creek Fulton County	Creek Chub	Up to 5		1
Mississinewa River <i>Consumption of fish from the Mississinewa River should be limited to no more than one meal per month (Group 3) for the general population and NO CONSUMPTION by the at-risk population. Exceptions to this advice for the general population are listed below:</i>				
	Carp	Up to 18	<input type="checkbox"/>	4
		18+	<input type="checkbox"/>	5
	Channel Catfish	Up to 15	<input type="checkbox"/>	4
		15+	<input type="checkbox"/>	5
	Green Sunfish	3+	<input type="checkbox"/>	5
	Quillback	15+	<input type="checkbox"/>	4
	Smallmouth Bass	14+	<input type="checkbox"/>	4
Randolph County				

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(For women and children, please refer to the Guidelines on page 5.)

Location	Species	Fish Size (Inches)	Contaminant	Group
<b>Mississinewa River Cont.</b>				
Randolph County Cont.	White Crappie	10+	<input type="checkbox"/>	4
	White Sucker	10+	<input type="checkbox"/>	4
Delaware County	Carp	21+	<input type="checkbox"/>	4
	Channel Catfish	21+	<input type="checkbox"/>	4
	Quillback	15+	<input type="checkbox"/>	4
Grant County	White Sucker	10+	<input type="checkbox"/>	4
	Carp	21+	<input type="checkbox"/>	4
	Channel Catfish	24+	<input type="checkbox"/>	4
	Flathead Catfish	17+	<input type="checkbox"/>	4
	Quillback	13+	<input type="checkbox"/>	4
	White Sucker	10+	<input type="checkbox"/>	4
Miami County	Carp	15-20	<input type="checkbox"/>	3
		20-25	<input type="checkbox"/>	4
		25+	<input type="checkbox"/>	5
<b>Mud Creek</b>				
Fulton County	Creek Chub	Up to 7		1
	White Sucker	Up to 11		1
<b>Muddy Fork of Sand Creek</b>				
Decatur County	Black Redhorse	15+	<input type="checkbox"/>	3
	Largemouth Bass	6-11	<input type="checkbox"/>	3
		11+	<input type="checkbox"/>	4
	Longear Sunfish	Up to 4		1
	Northern Hogsucker	6-10	<input type="checkbox"/>	3
		10+	<input type="checkbox"/>	4
	White Sucker	10-12		1
<b>Muscatatuck River</b>				
Jackson/Washington Counties	Bigmouth Buffalo	26+	<input type="checkbox"/>	3
	Carp	23+	<input type="checkbox"/>	3
	Channel Catfish	Up to 21		1
	Smallmouth Buffalo	23+	<input type="checkbox"/>	3
<b>North Fork Salt Creek</b>				
Brown County	Carp	23+	<input type="checkbox"/>	2
	Longear Sunfish	All		1
<b>North Fork Vernon Fork Muscatatuck River</b>				
Jennings County	Carp	20+	<input type="checkbox"/>	2
	Longear Sunfish	All		1

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 (For women and children, please refer to the Guidelines on page 5.)

Location	Species	Fish Size (Inches)	Contaminant	Group
<b>Otter Creek</b>				
Vigo County	Black Redhorse	14+	<input type="checkbox"/>	3
	Spotted Bass	8+	<input type="checkbox"/>	3
<b>Paw Paw Creek</b>				
Miami County	Creek Chub	Up to 7		1
	White Sucker	Up to 10		1
<b>Patoka River</b>				
Dubois County	Bigmouth Buffalo	21+	<input type="checkbox"/>	3
	Channel Catfish	19+	<input type="checkbox"/>	3
Gibson County	Black Buffalo	25+	<input type="checkbox"/>	3
	Channel Catfish	18+	<input type="checkbox"/>	3
	Flathead Catfish	20+	<input type="checkbox"/>	3
Pike County	Freshwater Drum	22+	<input type="checkbox"/>	3
<b>Pigeon Creek (St. Joseph River Basin)</b>				
Steuben County	Carp	21-25	<input type="checkbox"/>	3
		25+	<input type="checkbox"/>	4
<b>Pigeon Creek (Ohio River Basin)</b>				
Vanderburgh County	Channel Catfish	11-13	<input type="checkbox"/>	3
		14+	<input type="checkbox"/>	4
	Flathead Catfish	Up to 18	<input type="checkbox"/>	3
	Freshwater Drum	19+	<input type="checkbox"/>	3
<b>Pigeon River</b>				
LaGrange County	Hornyhead Chub	Up to 6		1
	Rock Bass	Up to 8		1
<b>Pipe Creek</b>				
Madison County	White Sucker	12+	<input type="checkbox"/>	3
Miami County	Creek Chub	Up to 7		1
	White Sucker	Up to 10		1
<b>Pleasant Run Creek</b>				
Lawrence County	ALL SPECIES	ALL	<input type="checkbox"/>	5
<b>Prairie Creek</b>				
Boone County	Creek Chub	6-7	<input type="checkbox"/>	3
<b>Richland Creek</b>				
Monroe/Greene/Owen Counties	Black Redhorse	13+	<input type="checkbox"/>	3
	Creek Chub	5-7	<input type="checkbox"/>	3
		7+	<input type="checkbox"/>	4
	Freshwater Drum	15+	<input type="checkbox"/>	3
	Largemouth Bass	13+	<input type="checkbox"/>	3
	Longear Sunfish	6+	<input type="checkbox"/>	3
	Rock Bass	7+	<input type="checkbox"/>	3
	Spotted Bass	12+	<input type="checkbox"/>	3
	White Sucker	8-11	<input type="checkbox"/>	3
		11+	<input type="checkbox"/>	4

Location	Species	Fish Size (Inches)	Contaminant	Group
Rock Creek Huntington County	Carp	20+	○	2
	Longear Sunfish	Up to 4		1
Salamonie River Jay/Blackford/ Huntington/ Wabash Counties	Carp	Up to 19	□○	1
		19+		2
	Freshwater Drum	Up to 11		1
	Golden Redhorse	Up to 11		1
	Rock Bass	Up to 6		1
	Spotted Sucker	Up to 10		1
	White Crappie	Up to 7		1
Salt Creek Monroe County** (tailwaters of Monroe Reservoir Dam to Clear Creek)	White Sucker	Up to 10		1
	Freshwater Drum	Up to 16	□	4
		16+	□	5
	Striped Bass	12+	□	3
	Walleye	15-21	□	3
Salt Creek Monroe County (confluence of Clear Creek to Lawrence County)		21+	□	4
	ALL SPECIES	ALL	□	5
	**This listing is based on limited data. It should be noted that fish migrate. Fish not sampled from these waters may migrate from the confluence of Clear Creek and Salt Creek, 1.3 miles south. Those water bodies have No Consumption advisories. Future sampling of the Salt Creek tailwaters below the Monroe Reservoir Dam is planned for more comprehensive results.			
	Black Redhorse	Up to 7		1
Sand Creek Decatur/Jackson/Jennings Counties	Carp	13-27	○	2
		27+	○	3
	Longear Sunfish	Up to 4		1
	Northern Hogsucker	Up to 8		1
	River Carpsucker	Up to 12		1
	White Sucker	Up to 8		1
	Yellow Bullhead	10-12	□	3
Silver Creek Floyd County		12+	□	4
	Carp	21-25	□	3
		25+	□	4
	Channel Catfish	Up to 10		1
	Freshwater Drum	18+	□	3
	Longear Sunfish	Up to 5		1

Location	Species	Fish Size (Inches)	Contaminant	Group
South Fork Wildcat Creek Clinton/Tiptecanoe Counties	Black Redhorse	13+	□	3
	Carp	Up to 18	□	2
		18-26	□	3
		26+	□	4
	Channel Catfish	19+	□	3
	Creek Chub	7+	□	3
	Golden Redhorse	11+	□	3
	Longear Sunfish	4+	□	3
	Rock Bass	7+	□	3
	Smallmouth Bass	10+	□	3
	White Sucker	12+	□	3
Stony Creek Hamilton County	ALL SPECIES	ALL	□	5
	Creek Chub	8+	□	3
Stouts Creek Monroe County	Black Crappie	9-11	□	3
		11+	□	4
St. Joseph River (Lake Erie Basin) Allen County	Black Redhorse	13-16	□	3
		16+	□	4
	Carp	Up to 20	□	2
	Channel Catfish	16+	□	3
	Golden Redhorse	12-13	□	3
		13+	□	4
	Largemouth Bass	Up to 11		1
St. Joseph River (Lake Michigan Basin) Elkhart County	Rock Bass	7-9	□	3
		9+	□	4
	Spotted Sucker	Up to 14		1
	White Crappie	Up to 11		1
	Bluegill	Up to 8		1
	Carp	25-28	□	3
		28+	□	4
	Channel Catfish	29+	□○	3
	Golden Redhorse	17+	□	3
	Northern Hogsucker	15+	□	3
	Rock Bass	Up to 7		1

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Location	Species	Fish Size (Inches)	Contaminant	Group
St. Joseph River (Lake Michigan Basin) Cont. Elkhart County Cont.	Shorthead Redhorse	15-17	<input type="checkbox"/>	3
		17+	<input type="checkbox"/>	4
	Walleye	16+	<input type="checkbox"/>	3
	White Sucker	Up to 14		1
St. Joseph County (Baugo Bay Area)	Bluegill	Up to 8		1
	Channel Catfish	Up to 22	<input type="checkbox"/>	3
		22+	<input type="checkbox"/>	4
	Largemouth Bass	Up to 13		1
St. Joseph County	Rock Bass	Up to 8		1
	White Sucker	Up to 14		1
	Black Redhorse	16-18	<input type="checkbox"/>	3
		18+	<input type="checkbox"/>	4
	Bluegill	Up to 7	<input type="checkbox"/>	3
		7+	<input type="checkbox"/>	4
	Carp	Up to 20	<input type="checkbox"/>	4
	Channel Catfish	All	<input type="checkbox"/>	4
	Golden Redhorse	All	<input type="checkbox"/>	5
	Largemouth Bass	14+	<input type="checkbox"/>	3
St. Marys River Allen County	Quillback	18+	<input type="checkbox"/>	3
	Rainbow Trout (also known as Steelhead)	25-31	<input type="checkbox"/>	3
		31+	<input type="checkbox"/>	4
	Shorthead Redhorse	15-19	<input type="checkbox"/>	3
		19+	<input type="checkbox"/>	4
	Smallmouth Bass	9+	<input type="checkbox"/>	3
	White Sucker	14-16	<input type="checkbox"/>	3
	Yellow Bullhead	Up to 10	<input type="checkbox"/>	2
	Black Redhorse	15+	<input type="checkbox"/>	3
	Carp	Up to 20	<input type="checkbox"/>	3
St. Joseph County		20+	<input type="checkbox"/>	4
	Channel Catfish	13-15	<input type="checkbox"/>	3
		15+	<input type="checkbox"/>	4
	Largemouth Bass	Up to 15	<input type="checkbox"/>	3
		15+	<input type="checkbox"/>	4
	Silver Redhorse	17+	<input type="checkbox"/>	3
St. Joseph County	White Sucker	11+	<input type="checkbox"/>	3

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Location	Species	Fish Size (Inches)	Contaminant	Group
Sugar Creek (East Fork White River Basin) Hancock/Johnson/Shelby Counties	Black Redhorse	9-16		1
	Carp	Up to 24	<input type="checkbox"/>	2
		24+	<input type="checkbox"/>	3
	Longear Sunfish	Up to 5		1
Sugar Creek, Walnut Fork Montgomery County	Northern Hogsucker	Up to 11		1
	All fish in this upstream portion of the Walnut Fork of Sugar Creek should be limited to no more than one meal per week (Group 2) for the general population. Exceptions to this advice for the general population are listed.			
	Black Redhorse	Up to 14	<input type="checkbox"/>	3
		14+	<input type="checkbox"/>	4
Sugar Creek (Middle Wabash River Basin) Montgomery County - Upstream of I-74	All fish upstream of I-74 are located well above the known PCB contamination sources. They have been found to be much lower in contaminants. Follow the General Safe Eating Guidelines. Exceptions to this are listed.			
	Black Redhorse	Up to 13		1
	Longear Sunfish	Up to 6		1
	Consumption of any fish from this reach of Sugar Creek should be limited to no more than six meals per year (Group 4) for the general population and NO CONSUMPTION by the at-risk population. Exceptions to this advice for the general population are listed.			
Montgomery County - I-74 to State Road 32	Black Redhorse	13+	<input type="checkbox"/>	5
	Channel Catfish	14+	<input type="checkbox"/>	5
	Freshwater Drum	13+	<input type="checkbox"/>	5
	Rock Bass	9+	<input type="checkbox"/>	5
	Smallmouth Bass	9+	<input type="checkbox"/>	5
	Consumption of any fish from this reach of Sugar Creek should be limited to no more than one meal per month (Group 3) for the general population and NO CONSUMPTION of any fish by the at-risk population. Exceptions to this advice for the general population are listed.			
Montgomery County - State Road 32 to Parke County including stream reaches along Shades and Turkey Run State Parks	Black Redhorse	15+	<input type="checkbox"/>	4
	Channel Catfish	Up to 13	<input type="checkbox"/>	2
		20+	<input type="checkbox"/>	4
	Flathead Catfish	23+	<input type="checkbox"/>	4
	Rock Bass	All	<input type="checkbox"/>	2
	Shorthead Redhorse	Up to 13	<input type="checkbox"/>	2
Montgomery County		15+	<input type="checkbox"/>	4
	Smallmouth Bass	19+	<input type="checkbox"/>	4

Location	Species	Fish Size (Inches)	Contaminant	Group
<b>Sugar Creek (Middle Wabash River Basin) (Cont.)</b>				
Parke County to the Wabash River				
<i>Consumption of any fish from this portion of Sugar Creek should be limited to no more than one meal per week (Group 2) for the general population and limited consumption of one meal per month of any fish for the at-risk population. Exceptions to this advice for the general population are listed.</i>				
<b>Tanners Creek</b> Dearborn County	Black Redhorse	14+	<input type="checkbox"/>	3
	Channel Catfish	13-20 20+	<input type="checkbox"/>	3 4
	Freshwater Drum	16+	<input type="checkbox"/>	3
	Sauger	17+	<input type="checkbox"/>	3
	Smallmouth Bass	15+	<input type="checkbox"/>	3
	Spotted Bass	15+	<input type="checkbox"/>	4
	Bluegill	Up to 6	<input type="checkbox"/>	1
	Carp	19-21 21+	<input type="checkbox"/> <input type="checkbox"/>	2 3
	Largemouth Bass	Up to 13 17+	<input type="checkbox"/> <input type="checkbox"/>	1 3
<b>Tippecanoe River</b> Kosciusko County (Oswego to State Road 15)				
	Bluegill	Up to 5	<input type="checkbox"/>	1
	Carp	Up to 23 23+	<input type="checkbox"/> <input type="checkbox"/>	2 3
	Longear Sunfish	Up to 5	<input type="checkbox"/>	1
	Rock Bass	Up to 6	<input type="checkbox"/>	1
	Warmouth	Up to 6	<input type="checkbox"/>	1
Kosciusko County (Downstream of State Road 15)				
	Bluegill	6+	<input type="checkbox"/>	3
	Carp	20-27 27+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Redhorse Species	16-18 18+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Carp	Up to 24 24+	<input type="checkbox"/> <input type="checkbox"/>	2 3
Fulton County	Carp	16-25 25+	<input type="checkbox"/> <input type="checkbox"/>	2 3
Pulaski County	Longear Sunfish	Up to 4	<input type="checkbox"/>	1
Carroll County	Carp	21-22 22+	<input type="checkbox"/> <input type="checkbox"/>	2 3
<b>Trail Creek</b> LaPorte County				
	Brown Trout	18+	<input type="checkbox"/>	3
	Carp	Up to 23 23+	<input type="checkbox"/> <input type="checkbox"/>	4 5
	Rock Bass	10+	<input type="checkbox"/>	3

Location	Species	Fish Size (Inches)	Contaminant	Group
<b>Trail Creek Cont.</b> LaPorte County Cont.				
	Smallmouth Bass	14-19 19+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Walleye	18-27 27+	<input type="checkbox"/> <input type="checkbox"/>	3 4
<b>Travers Ditch</b> Fulton County				
	Blacknose Dace	Up to 2	<input type="checkbox"/>	1
	Creek Chub	Up to 3	<input type="checkbox"/>	1
<b>Unnamed Tributary of Eel River</b> Miami County				
<b>Wabash River</b> Adam and Wells Counties	Channel Catfish	21+	<input type="checkbox"/>	3
	Freshwater Drum	Up to 12	<input type="checkbox"/>	1
	Golden Redhorse	Up to 13	<input type="checkbox"/>	1
	White Crappie	Up to 9	<input type="checkbox"/>	1
	Blue Sucker	21-26 26+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Freshwater Drum	Up to 12	<input type="checkbox"/>	1
	White Bass	11-21 21+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Black Redhorse	19+	<input type="checkbox"/>	3
	Blue Sucker	21-26 26+	<input type="checkbox"/> <input type="checkbox"/>	3 4
Huntington and Wabash Counties	Channel Catfish	15+	<input type="checkbox"/>	3
	Sauger	13+	<input type="checkbox"/>	3
	Shorthead Redhorse	15+	<input type="checkbox"/>	3
	Smallmouth Buffalo	Up to 20 20+	<input type="checkbox"/> <input type="checkbox"/>	3 4
Miami, Cass, Carroll, and Tippecanoe (upstream of Lafayette) Counties	Bigmouth Buffalo	18+	<input type="checkbox"/>	3
	Blue Sucker	21-26 26+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	<b>Carp suckers</b>	Up to 13 13-19 19+	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	3 4 5
	Channel Catfish	Up to 20 20+	<input type="checkbox"/> <input type="checkbox"/>	3 4
	Flathead Catfish	21+	<input type="checkbox"/>	3
	Paddlefish	34+	<input type="checkbox"/>	3
	Sauger	13+	<input type="checkbox"/>	3
	Smallmouth Buffalo	Up to 20 20+	<input type="checkbox"/> <input type="checkbox"/>	3 4
Tippecanoe (downstream from Lafayette), Fountain, Warren, Vermillion and Parke Counties				

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Location	Species	Fish Size (Inches)	Contaminant	Group
Wabash River Cont. Vigo, Sullivan and Knox Counties	Bigmouth Buffalo	21-24 24+	<input type="checkbox"/>	3 4
	Blue Sucker	21-26 26+	<input type="checkbox"/>	3 4
	Carp	17+	<input type="checkbox"/>	3
	Channel Catfish	13-22 22+	<input type="checkbox"/>	3 4
	Flathead Catfish	21+	<input type="checkbox"/>	3
	Freshwater Drum	16+	<input type="checkbox"/>	3
	Paddlefish	34+	<input type="checkbox"/>	3
	Sauger	13+	<input type="checkbox"/>	3
	Shovelnose Sturgeon	30+	<input type="checkbox"/>	3
	Striped/Wiper Bass	10-12	<input type="checkbox"/>	3
	Bigmouth Buffalo	21-24 24+	<input type="checkbox"/>	3 4
	Blue Sucker	21-26 26+	<input type="checkbox"/>	3 4
	Bluegill	Up to 6	<input type="checkbox"/>	1
	Carp	17+	<input type="checkbox"/>	3
	Channel Catfish	20+	<input type="checkbox"/>	3
	Flathead Catfish	21+	<input type="checkbox"/>	3
	Freshwater Drum	16+	<input type="checkbox"/>	3
	Paddlefish	34+	<input type="checkbox"/>	3
	Sauger	13+	<input type="checkbox"/>	3
	Shovelnose Sturgeon	30+	<input type="checkbox"/>	3
	Striped/Wiper Bass	10-12	<input type="checkbox"/>	3
	White Bass	11-21 21+	<input type="checkbox"/>	3 4
Wea Creek	ALL SPECIES	ALL	<input type="checkbox"/>	5
Tippecanoe County				
West Fork of White River Randolph County	Carp	18-22 22+	<input type="checkbox"/>	2 3
	Channel Catfish	14-16	<input type="checkbox"/>	3
	Creek Chub	8+	<input type="checkbox"/>	3
	Longear Sunfish	5+	<input type="checkbox"/>	3

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Location	Species	Fish Size (Inches)	Contaminant	Group
West Fork of White River Cont. Randolph County Cont.	Quillback	13-18 18+	<input type="checkbox"/>	3 4
	Spotted Sucker	11-13 13+	<input type="checkbox"/>	3 4
	Black Bullhead	9+	<input type="checkbox"/>	3
	Black Redhorse	14-16 16+	<input type="checkbox"/>	3 4
Delaware County	Channel Catfish	14-16 16+	<input type="checkbox"/>	3 4
	Largemouth Bass	10-15 15+	<input type="checkbox"/>	3 4
	Quillback	13-18 18+	<input type="checkbox"/>	3 4
	Spotted Sucker	11-13 13+	<input type="checkbox"/>	3 4
	White Sucker	15+	<input type="checkbox"/>	3
	Green Sunfish	6+	<input type="checkbox"/>	3
	Spotted Sucker	11+	<input type="checkbox"/>	3
	Carp	Up to 17 17-20 20+	<input type="checkbox"/>	3 4 5
	Largemouth Bass	11-17 17+	<input type="checkbox"/>	3 4
	Longear Sunfish	4-9 9+	<input type="checkbox"/>	3 4
Madison County	Quillback	13-18 18+	<input type="checkbox"/>	3 4
	Largemouth Bass	11-16 16+	<input type="checkbox"/>	3 4
	Bluegill	Up to 6	<input type="checkbox"/>	1
	Carp	Up to 19 19+	<input type="checkbox"/>	4 5
	Channel Catfish	12-17 17+	<input type="checkbox"/>	3 4
	Flathead Catfish	13-15 15+	<input type="checkbox"/>	3 4
	Largemouth Bass	17+	<input type="checkbox"/>	3
	River Carpsucker	14-17 17+	<input type="checkbox"/>	3 4
	Quillback	13-18 18+	<input type="checkbox"/>	3 4
	Smallmouth Bass	11+	<input type="checkbox"/>	3
Hamilton County	Spotted Bass	11-13 13+	<input type="checkbox"/>	3 4
Marion County (Upstream of Broad Ripple Dam) Marion County (Downstream of Broad Ripple Dam)				

Location	Species	Fish Size (Inches)	Contaminant	Group
<b>West Fork of White River (Cont.)</b>				
Morgan County	Black Redhorse	15-16	<input type="checkbox"/>	3
		16+	<input type="checkbox"/>	4
	Carp	16-27	<input type="checkbox"/>	3
		27+	<input type="checkbox"/>	4
	Channel Catfish	18-22	<input type="checkbox"/>	3
		22+	<input type="checkbox"/>	4
	Flathead Catfish	Up to 30	<input type="checkbox"/>	4
		30+	<input type="checkbox"/>	5
	Largemouth Bass	16+	<input type="checkbox"/>	3
	Quillback	13-18	<input type="checkbox"/>	3
		18+	<input type="checkbox"/>	4
	River Carpsucker	14-17	<input type="checkbox"/>	3
	Smallmouth Bass	15-17	<input type="checkbox"/>	3
		17+	<input type="checkbox"/>	4
	Spotted Bass	11-13	<input type="checkbox"/>	3
		13+	<input type="checkbox"/>	4
	Spotted Sucker	11-13	<input type="checkbox"/>	3
		13+	<input type="checkbox"/>	4
Owen County	Bigmouth Buffalo	24+	<input type="checkbox"/>	3
	Channel Catfish	15+	<input type="checkbox"/>	3
	Freshwater Drum	15+	<input type="checkbox"/>	3
	Quillback	13-18	<input type="checkbox"/>	3
		18+	<input type="checkbox"/>	4
	River Carpsucker	15+	<input type="checkbox"/>	3
	Sauger	Up to 14	<input type="checkbox"/>	3
		14+	<input type="checkbox"/>	4
	Spotted Bass	11+	<input type="checkbox"/>	3
	Spotted Sucker	11-13	<input type="checkbox"/>	3
		13+	<input type="checkbox"/>	4
	White Bass	14-15	<input type="checkbox"/>	3
Greene County		15+	<input type="checkbox"/>	4
	Bigmouth Buffalo	20+	<input type="checkbox"/>	3
	Channel Catfish	14-16	<input type="checkbox"/>	3
		16+	<input type="checkbox"/>	4
	Quillback	18+	<input type="checkbox"/>	3
	River Carpsucker	15+	<input type="checkbox"/>	3
	Spotted Sucker	11-13	<input type="checkbox"/>	3
		13+	<input type="checkbox"/>	4
	Bigmouth Buffalo	19+	<input type="checkbox"/>	3
	Channel Catfish	18+	<input type="checkbox"/>	3
Daviness County	Flathead Catfish	14+	<input type="checkbox"/>	3

Location	Species	Fish Size (Inches)	Contaminant	Group
<b>West Fork of White River (Cont.)</b>				
Daviness County Cont.	Quillback	13-18	<input type="checkbox"/>	3
		18+	<input type="checkbox"/>	4
	Spotted Sucker	11-13	<input type="checkbox"/>	3
		13+	<input type="checkbox"/>	4
	White Bass	14-15	<input type="checkbox"/> <input type="checkbox"/>	3
	15+	<input type="checkbox"/>	4	
<b>White River</b>				
Pike/Gibson Counties	Bigmouth Buffalo	25+	<input type="checkbox"/>	3
	Channel Catfish	18+	<input type="checkbox"/>	3
	Flathead Catfish	16+	<input type="checkbox"/>	3
	Largemouth Bass	17+	<input type="checkbox"/>	3
	Quillback	13-18	<input type="checkbox"/>	3
		18+	<input type="checkbox"/>	4
	Smallmouth Bass	12+	<input type="checkbox"/>	3
	Smallmouth Buffalo	18-22	<input type="checkbox"/>	3
		22+	<input type="checkbox"/>	4
	Spotted Bass	9+	<input type="checkbox"/>	3
	Spotted Sucker	11-13	<input type="checkbox"/>	3
		13+	<input type="checkbox"/>	4
<b>White Lick Creek</b>				
Hendricks County	Channel Catfish	22+	<input type="checkbox"/>	3
	Smallmouth Bass	14+	<input type="checkbox"/>	3
	Channel Catfish	22+	<input type="checkbox"/>	3
	Smallmouth Bass	12+	<input type="checkbox"/>	3
Morgan County				
<b>Whitewater River</b>				
(Greens Fork, Martindale Creek, Middle Fork, Noland's Fork, West Fork)				
Wayne/Fayette/ Franklin/Dearborn Counties	Black Redhorse	22+	<input type="checkbox"/>	3
	Carp	19-25	<input type="checkbox"/> <input type="checkbox"/>	2
		25+	<input type="checkbox"/> <input type="checkbox"/>	3
	Channel Catfish	20+	<input type="checkbox"/>	3
	Freshwater Drum	15+	<input type="checkbox"/>	3
	Golden Redhorse	Up to 14		1
	Longear Sunfish	Up to 5		1
	Northern Hogsucker	Up to 9		1
	Rock Bass	Up to 7		1
	Smallmouth Bass	Up to 10		1
	White Sucker	Up to 10		1

General Population ☐ = Mercury ☐ = PCBs  
Group 1 = Unlimited meals Group 2 = 1 meal/week Group 3 = 1 meal/month  
Group 4 = 1 meal/2 months Group 5 = DO NOT EAT  
(For women and children, please refer to the Guidelines on page 5.)

Location	Species	Fish Size (Inches)	Contaminant	Group
<b>Whitewater River (West Fork of the East Fork)</b>				
Wayne County	White Sucker	Up to 7		1
<b>Wildcat Creek</b>				
Howard County (Upstream of the Waterworks Dam in Kokomo)				
	Bluegill	Up to 6		1
	Carp	Up to 21	<input type="checkbox"/>	3
	Longear Sunfish	Up to 5		1
	Rock Bass	Up to 6		1
Howard County (Downstream of the Waterworks Dam in Kokomo)				
	<b>All Species</b>	<b>ALL</b>	<input type="checkbox"/>	<b>5</b>
Carroll County	<b>All Species</b>	<b>ALL</b>	<input type="checkbox"/>	<b>5</b>
<i>Consumption of fish from the Wildcat Creek in Tippecanoe County should be limited to no more than one meal every two months or six meals per year (Group 4) for the general population and NO CONSUMPTION for the at-risk population. Exceptions to this advice for the general population are listed below.</i>				
Tippecanoe County				
	Black Bass Species	10+	<input type="checkbox"/>	3
	<b>Carp</b>	<b>ALL</b>	<input type="checkbox"/>	<b>5</b>
	Carp sucker	12-13	<input type="checkbox"/>	3
	Channel Catfish	Up to 22	<input type="checkbox"/>	3
	<b>Flathead Catfish</b>	<b>18+</b>	<input type="checkbox"/>	<b>5</b>
	<b>Freshwater Drum</b>	<b>16+</b>	<input type="checkbox"/>	<b>5</b>
	Golden Redhorse	12-14	<input type="checkbox"/>	3
	Longear Sunfish	Up to 5	<input type="checkbox"/>	3
	<b>Shorthead Redhorse</b>	<b>13+</b>	<input type="checkbox"/>	<b>5</b>
	<b>White Bass</b>	<b>ALL</b>	<input type="checkbox"/>	<b>5</b>
<b>Wilson Ditch</b>				
Miami County	Creek Chub	Up to 5		1
<b>Young's Creek</b>				
Johnson County	Northern Hogsucker	10+	<input type="checkbox"/>	3

General Population    ☐ = Mercury    ☐ = PCBs

Group 1 = Unlimited meals    Group 2 = 1 meal/week    Group 3 = 1 meal/month

Group 4 = 1 meal/2 months    Group 5 = DO NOT EAT

(For women and children, please refer to the Guidelines on page 5.)

## **Nine Minimum Controls – No. 9**

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### **EXHIBIT I-5**

# Partial Monitoring Plan

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## INTRODUCTION

The steps for developing a monitoring plan are:

1. Define the short- and long- term objectives
2. Decide whether to use a model
3. Identify data needs
4. Identify sampling criteria
5. Develop data management and analysis procedures
6. Address implementation issues

## OBJECTIVES

The objectives of a monitoring plan are to:

1. Evaluate the effectiveness of the Nine Minimum Controls (NMC).
2. Define the CSS's hydraulic response to rainfall.
3. Determine CSO flows and pollutant concentrations/loadings.
4. Evaluate the impact of CSOs on receiving water quality.
5. Support model input, calibration, and verification.
6. Support the review and revision, as appropriate, of WQS.
7. Evaluate and select long-term CSO control alternatives.

Objective #1 will be the subject of this partial monitoring plan. The other objectives will be addressed in the CSO LTCP.

## MODEL STRATEGY

No model will be used to evaluate the effectiveness of the NMC.

## DATA NEEDS

The list of questions below help identify the data needs.

- Have dry weather overflows been eliminated?
- Has wet weather flow to the POTW increased?
- Has the level of rainfall needed to cause CSOs increased?

The following data is required to answer these questions.

- Rain Event Data: start time, total volume, duration, & maxima intensity
- Runoff Event Data: Date of runoff event
- Overflow Event Data: start time & duration
- WPCP Flow Data: Daily plant influent volume

# Partial Monitoring Plan

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## SAMPLING CRITERIA

### Duration

Runoff event data need to be collected every day of the year. During warmer periods rain event data can be used. During periods when freezing occurs visual inspections will have to be made. Overflow event data and WPCP flow data will also need to be collected every day of the year.

### Location

Overflow event data will need to be collected at all regulators where significant overflows occur. Rain event data will need to be collected through out the combined sewer system (CSS) for the months April through November and from the Fort Wayne International Airport for the months of December through March. WPCP flow data will need to be collected at the headworks of the WPCP.

### Frequency

Rain event data and overflow event data will need to be collected continuously. WPCP flow and runoff event data can be collected daily.

### Pollutants

Only flow volume will need to be collected.

### Data Management

Rain event data, runoff event data, and overflow event data will be collected and processed and saved by WPC Maintenance as described in the CSO Monitoring Program procedures. WPCP influent flow data will be collected by WPCP operators and recorded on their monthly reports.

### Analysis

- Rain events will be defined as ending at the beginning of the first 6 hour dry period following its start. Overflow events for each regulator will be matched with the rain events that caused them. If an overflow event is not associated with a rain event then it will be identified as a dry weather overflow (DWO). If an overflow event continues long after the rain event ends it will be investigated to determine if it is a DWO. The number of DWOs that occurred during a year will be determined and compared to previous annual DWO totals.

# Partial Monitoring Plan

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- Total annual WPCP influent volume will be compared to previous annual volumes to see if it increases.
- Rain events will be defined as ending at the beginning of the first 6 hour dry period following its start. All rain data collected between April 1 and November 30 will be grouped into rain events. Overflow events for each regulator will be matched with the rain events that caused them. The smallest rain event that caused an overflow event for each regulator will be identified and compared with those identified in previous years to determine if the rain event size is increasing.
- Fort Wayne's rivers have been analyzed for a fish advisory. Mercury and PCBs are the fish tissue contaminants identified the 2004 303(d) Report lists only PCBs as a fish advisory. The proposed 2006 303(d) Report lists only PCBs as a fish tissue contaminant. The City has tested CSOs and did not find PCBs present. This concludes that fish advisories are not a result of CSOs.

## Implementation issues

All data is currently being collected and all implementation issues are described in the appropriate program's written procedures.

## **Nine Minimum Controls – No. 9**

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### **EXHIBIT I-6**

# 2006 Regulator Metering Summary

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The City of Fort Wayne has 43 Combined Sewer Overflow discharge points. The flow at 33 of these points is measured with flow meters. The flow at 5 of these points is pumped into the receiving waters and measured using run time meters. Three of the sites (007, 012, & 027) are gravity discharge points that are only used when the adjacent pump station is completely down.

The durations and volumes for the 38 sites that are metered are presented on the attached spreadsheet. The spreadsheet lists the discharge points in numerical order, ranks its volume and duration relative to the other metered sites, and gives each site's total volume and duration for 2006.

CSO OUTFALL NO.	Volume		Duration	
	Rank	Total (MG)	Rank	Total (HRS)
4	16	15.282	10	405.25
5	4	192.772	3	1074.40
7	37	0.000	37	0.00
11	12	24.305	33	57.34
12	28	4.294	36	6.07
13	7	52.626	29	70.25
14	36	0.021	30	66.50
16	37	0.000	37	0.00
17	13	23.387	27	79.25
18	1	768.937	8	678.25
19	32	1.277	34	41.75
20	6	59.329	6	795.00
21	26	5.050	31	64.00
23	21	9.424	23	98.25
24	24	7.001	35	24.75
25	25	6.282	26	80.75
26	3	246.642	4	880.00
27	37	0.000	37	0.00
28	20	11.061	24	88.53
29	30	2.841	25	81.50
32	9	39.786	13	328.00
33	2	309.327	5	857.67
36	27	4.722	28	75.25
39	19	14.267	17	221.75
44	34	0.433	22	100.50
45	35	0.184	21	107.50
48	5	130.496	7	770.71
50	15	17.680	15	239.00
51	29	2.907	32	58.00
52	23	7.863	14	326.80
53	22	8.488	1	5459.00
54	18	15.034	2	1312.20
55	11	28.812	11	402.75
56	8	40.650	12	378.04
57	37	0.000	37	0.00
58	33	1.127	18	167.75
60	17	15.080	20	135.75
61	14	21.382	16	223.50
62	10	32.888	19	144.50
64	31	2.461	9	598.00
67	37	0.000	37	0.00
68	37	0.000	37	0.00
P10-001	37	0.000	37	0.00
		2124.118		

# CSO OPERATIONAL PLAN

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## GLOSSARY

### A

**ACPWQ:** Allen County Partnership for Water Quality – ACPWQ was created by the City and other local governmental entities to help educate the public and the media about water resource issues.

**Activated Sludge:** A result of the following process: primary effluent is mixed with bacteria-laden sludge and then agitated and aerated to promote biological treatment, speeding the breakdown of organic matter in raw sewage undergoing secondary waste treatment.

**Algae:** Simple rootless plants that grow in sunlit waters in proportion to the amount of available nutrients. They can affect water quality adversely by lowering the dissolved oxygen in the water. They are food for fish and small aquatic animals.

**AO:** Administrative Order

**Aqua Indiana:** A private utility serving large areas of western and northern Fort Wayne and Allen County.

### B

**Biosolids:** They are nutrient-rich organic materials resulting from the treatment of domestic sewage in a treatment facility. When treated and processed, these residuals can be recycled and applied as fertilizer to improve and maintain productive soils and stimulate plant growth.

**BMR:** Baseline Monitoring Report

**Board of Public Works:** The Utilities regulatory body, responsible for approving the Utilities rules and regulations and the appeal body for decisions and/or AOs made or issued by the Superintendent regarding industrial users.

**BOD:** Biological Oxygen Demand – A measure of the amount of oxygen consumed in the biological processes that break down organic matter in water. The greater the BOD, the greater the degree of pollution.

### C

**Catch Basin:** Structures used to collect storm water entering Fort Wayne's combined sewer system. A catch basin is a modified inlet where the invert of the outlet pipe is several feet above the bottom of the structure and where a 90 degree trap is installed on the end of the outlet pipe.

**CCC Limits:** Criterion Continuous Concentration – An estimate of the highest concentration of material in the water column to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect.

**CCTV:** Closed Circuit Television

**CFR:** Code of Federal Regulations

**City:** The City of Fort Wayne

**Collection System:** Pipes used to collect and carry wastewater from individual sources to an interceptor sewer that will carry it to a treatment facility.

**CMC Limits:** Criterion Maximum Concentration – An estimate of the highest concentration of a material in the water column to which an aquatic community can be exposed briefly without resulting in an unacceptable effect.

# CSO OPERATIONAL PLAN

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**CMMS:** Computerized Maintenance Management System keeps inventory of equipment, access parts information, and schedule maintenance activities and maintain a history of maintenance performed.

**CSO:** Combined Sewer Overflow – During heavy periods of rainfall or snowmelt, the wastewater volume in a combined sewer system can exceed the capacity of the sewer system or treatment plant. For this reason, combined sewer systems are designed to overflow occasionally and discharge excess wastewater directly to nearby streams, rivers, or other water bodies.

**CSS:** Combined Sewer System – A sewer system that carries both sewage and storm-water runoff. Normally, its entire flow goes to a waste treatment plant, but during wet weather, the volume may be so great as to cause overflows of untreated mixtures of storm water and sewage into receiving waters. Storm-water runoff may also carry toxic chemicals from industrial areas or streets into the sewer system.

**CSSCIP:** City’s Combined Sewer System Capacity Improvement Program

## **D**

**Dam:** A barrier to obstruct the flow of water.

**Designated Use:** Uses specified in water quality standards for each water body or segment whether or not they are being attained (40 CFR 131.3).

**DO:** Dissolved Oxygen – The oxygen freely available in water, vital to fish and other aquatic life and for the prevention of odors. DO levels are considered a most important indicator of a water body’s ability to support desirable aquatic life. Secondary and advanced waste treatment and generally designed to ensure adequate DO in waste-receiving waters.

**DMR:** Discharge Monitoring Report

**DWO:** Dry Weather Overflow – An overflow or discharge from a combined or sanitary sewerage system or storm drainage system that is not the result of wet-weather flows into the system. These flows may be the result of a variety of processes. Dry-weather overflows from combined sewer systems are generally not permitted.

## **E**

**Existing Use:** Uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards (40 CFR 131.3).

**EPA:** U.S. Environmental Protection Agency

## **G**

**GIS:** Geographic Information System – GIS is a term used to describe the creation, manipulation, analysis, and storage of spatial data. This technology integrates common database operations such as query and statistical analysis with geographic data through visualization and maps. These attributes distinguish GIS from other information systems and make it valuable for exploring options, explaining results, and deciding strategies.

## **I**

**IDEM:** Indiana Department of Environmental Management

**IMS:** Infrastructure Management System – Electronic database to track maintenance activities

# CSO OPERATIONAL PLAN

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**Industrial Pre-Treatment Program:** A City program that handles the process to reduce, eliminate, or alter the nature of wastewater pollutants from non-domestic sources (mostly industrial) before they are discharged into Publicly Owned Treatment Works (POTWs).

**Infiltration:** The penetration of water entering sewers or pipes through defective joints, connections, or manhole walls.

**Inflow:** Stormwater entering a sewer system from sources such as basement drains, manholes, and storm and driveway drains.

**Interceptor Sewer:** Large sewer lines that, in a combined system, control the flow of sewage to the treatment plant. In a storm, they allow some of the sewage to flow directly into a receiving stream, thus keeping it from overflowing onto the streets. Also used in separate systems to collect the flows from main and trunk sewers and carry them to treatment points.

**IU:** Industrial User

## L

**LIMS:** Laboratory Information Management System operates to collect analyze and report laboratory results.

**LTCP:** Long-Term Control Plan – A document developed by CSO communities to describe existing waterway conditions and various CSO abatement technologies that will be used to control overflows.

## M

**Manhole:** A hole, usually with a cover, through which a person may enter a sewer, boiler, drain, or similar structure.

**MGD:** Million Gallons per Day – Measure of flow.

**MRO:** Monthly Report of Operations

**MSDS:** Material Safety Data Sheet

## N

**NMC:** Nine Minimum Controls – Measures that can reduce CSOs and their effects on receiving water quality and that should not require significant engineering studies or major construction.

**NOV:** Notice of Violation

**NOW:** Notice of Warning

**NPDES:** National Pollutant Discharge Elimination System – A national program under Section 402 of the Clean Water Act (CWA) for regulation of discharges from point sources to waters of the United States. Discharges are illegal unless authorized by an NPDES permit.

## O

**O&M:** Operations and Maintenance

**Organic Matter:** Carbonaceous waste contained in plant or animal matter and originating from domestic or industrial sources.

## P

**PCB:** Polychlorinated Biphenyls

# CSO OPERATIONAL PLAN

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**pH:** An expression of the intensity of the basic or acid condition of a liquid; may range from 0 to 14, where 0 is the most acid and 7 neutral. Natural waters usually have a pH between 6.5 and 8.5.

**Photosynthesis:** The process in green plants and certain other organisms by which carbohydrates are synthesized from carbon dioxide and water using light as an energy source. Most forms of photosynthesis release oxygen as a byproduct.

**POTW:** Publicly Owned Treatment Works

**Primary Treatment:** Primary treatment is the second step in treatment and separates suspended solids and greases from wastewater. Waste-water is held in a quiet tank for several hours allowing the particles to settle to the bottom and the greases to float to the top. The solids drawn off the bottom and skimmed off the top receive further treatment as sludge. The clarified wastewater flows on to the next stage of wastewater treatment. Clarifiers and septic tanks are usually used to provide primary treatment. Removal of floating solids and suspended solids, both fine and coarse, from raw sewage.

**Pump Station (Lift Station):** A station positioned in the public sewer system at which wastewater is pumped to a higher level.

## **R**

**Regulator:** Engineered bottleneck in the collection system.

**Run Off:** That part of precipitation, snow melt, or irrigation water that runs off the land into streams or other surface water. It can carry pollutants from the air and land into receiving waters.

## **S**

**SAG:** Sewer Advisory Group – Fort Wayne’s SAG is a voluntary citizen-based group that has been actively helping the City make decisions about its sewer utility operations since 1995.

**Secondary Treatment:** The second step in most publicly owned waste treatment systems in which bacteria consume the organic parts of the waste. It is accomplished by bringing the waste, bacteria, and oxygen in trickling filters or in the activated sludge process. This treatment removes floating and settleable solids and about 90 percent of the oxygen-demanding substances and suspended solids. Disinfection is the final stage of secondary treatment.

**Sewage:** The waste and wastewater produced by residential and commercial sources and discharged into sewers.

**SIP:** Structure Inventory Program

**SIU:** Significant Industrial User – An indirect discharger that is the focus of control efforts under the national pretreatment program; includes all indirect dischargers subject to national categorical pretreatment standards, and all other indirect dischargers that contribute 25,000 gpd or more of process wastewater, or which make up five percent or more of the hydraulic or organic loading to the municipal treatment plant, subject to certain exceptions [40 CFR 122.23(b)(9)]

**SOP:** Standards of Operation

**SPCC:** Spill Prevention, Control and Countermeasure Plan

**SR CER:** Stream Reach Characterization and Evaluation Report

# CSO OPERATIONAL PLAN

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**SSO:** Sanitary Sewer Overflow – Untreated or partially treated sewage overflows from a sanitary sewer collection system.

**STF:** Sewer Task Force – STF was originally organized to develop recommendations on how the City should proceed to reduce the likelihood of sewer backups into basements. STF is now known as the Sewer Advisory Group (SAG).

**Storm Sewer:** A system of pipes (separate from sanitary sewers) that carry water runoff from buildings and land surfaces.

## T

**Trunk Sewer:** A sewer that receives many tributary branches and serves a large territory.

**TSS:** Total Suspended Solids – A measure of the suspended solids in wastewater, effluent, or water bodies, determined by tests for “total suspended non-filterable solids.”

## U

**U.S.EPA:** United States Environmental Protection Agency

**UTA:** Utility Administration Group

## V

**VTN:** Verbal Telephone Notice

## W

**Water Quality Criteria:** Levels of water quality expected to render a body of water suitable for its designated use. Criteria are based on specific levels of pollutants that would make the water harmful if used for drinking, swimming, farming, fish production, or industrial processes.

**WQS:** Water Quality Standards – State-adopted and EPA-approved ambient standards for water bodies. The standards prescribe the use of water body and establish the water quality criteria that must be met to protect designated uses.

**WEF:** Water Environment Federation

**Weir:** A wall or obstruction used to control flow from settling tanks and clarifiers to ensure a uniform flow rate and avoid short-circuiting.

**WPCM:** Water Pollution Control Maintenance

**WPCP:** Water Pollution Control Plant – Any equipment, device, unit, structure, etc., that is used to control, prevent, pretreat, or treat any discharge or threatened discharge of pollutants into any waters of the State of Indiana, including surface and subsurface waters and public or private sewerage systems.

**WQS:** Water Quality Standards – Regulations that are designed to protect the surface waters of the State. They contain statements and numeric limits that are adopted through administrative rule-making procedures. The standards set forth the water quality needed to protect the uses of the water, such as swimming, public water supply, and the propagation and growth of aquatic life.